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CONSERVATION OF THE MENSTRUAL FUNCTION *

W. J. MAYO, M.D.

ROCHESTER, MINN.

The surgeon approaches his work with the physical condition of the patient in view. He achieves a tangible success, but occasionally is not rewarded by the gratitude of the patient because of intangible changes in the nervous system which follow the operation. Physical cure is sometimes purchased at the price of nervous instability; and we speak wisely of neurasthenia, psychosis, neurosis and hysteria. Often the same physical cure could have been obtained without creating the disturbances so troublesome to the patient, the family and friends. Christian (?) science (?) and similar cults go to the other extreme, refusing to recognize the physical and considering only the psychic.

The central nervous system has a short heredity; its characteristics are not fixed, but unstable, especially in some families. The central nervous system is influencing, to a great extent, visceral functions that existed long before its development. Attempts at retroactive controls always have many exceptions in law, and are physiologically troublesome in man. The nervous system in man weighs as much as the liver and has as many or even more possibilities of functional disturbances, because it is less stable in its functions. The only difference is that the bile function can be seen, and disturbed thoughts cannot be seen—only their results. One group of physicians will say that all these psychic disturbances have a physical basis, apparently believing that a physical basis exists only outside the central nervous system. They then begin very properly to hunt for the cause of these disturbances, and often very improperly attempt to place the blame for them on some real or fancied physical defect with which there is little or no connection.

The uterus, the ovaries and the tubes have chiefly suffered from these misguided efforts at relief, efforts apparently based on the conception that woman's psychic disturbances are generated in her reproductive organs. After all, it is the mental and not the physical which controls our estimate of man.

To one who has had occasion to observe the results of surgical operations on the reproductive organs of women, the truth of these remarks is self evident. Today I consider every surgical disease of the generative organs of women with their future nervous condition in mind, as well as the physical state which is desired. In many instances there is no choice. In malignant disease of the generative organs radical operation is necessary to save life, with relatively small regard for the future mental condition of the patient. In cases of benign neoplasms and inflammatory disease, however, the future condition of the patient as related to the operation, *psychic* as well as physical, must ever be remembered. Happiness is a state of mind, and a state of mind is not necessarily a state of body. This belief is borne to the consulting surgeon by the large number of women he observes who have been operated on once, twice or many times. Their relations to life are changed, they are put out of touch with their social conditions, and they attempt, ever and again, to gain relief from mental and nervous suffering by further resort to treatment of the physical.

When I began practice, abdominal surgery was in its infancy. The ovaries and tubes were removed on indications that would not be considered today. With the growth of knowledge this practice ceased, but in its place developed many miscalled conservative operations. Instead of being removed, the ovary was subjected to unnecessary tinkering, and the ovary does not stand such operations well. Frequently the patient developed sequelae that necessitated removal of the ovaries later. The small cystic ovary especially has been the victim, not of the surgeon, but of the operator. Following this type of operations it will be found that a group of patients return complaining of what they have been told are adhesions, but without mechanical signs. I have seen a number of patients who have been operated on and reoperated on, with only temporary success, for adhesions that did not produce mechanical symptoms. I have little faith in the common belief that adhesions located by the patient, but which cannot be located by the surgeon, are the cause of serious trouble.

IMPORTANCE OF THE OVARY

The generative organs of women are for the purpose of reproduction. The ovary controls the physiologic cycle, the uterus receives and carries the impregnated ovum to term. The uterus is often blamed for troubles with which it really has little to do. The curet is a much abused instrument. The endometrium is relatively seldom diseased, and a high percentage of menstrual disturbances are ovarian and tubal in origin. A sufficient distinction is not made between irregular bleedings from the uterus and true menstruation. Menstrual blood does not clot. If the blood forms true clots, the endometrium may be suspected, otherwise, the ovary. The ovary is an organ of internal secretion independent of the production of ova. The

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-First Annual Session of the American Medical Association, New Orleans, April, 1920.

gonadial secretion of the interstitial cells of the ovary controls the development of the female characteristics. It influences the closure of the epiphyses of the long bones, and is related to the endocrine disturbances to which are due the tall, spindling types of giantism. The effect of the ovary on the individual, including menstruation, is independent of direct nervous connection. Tuffier,[1] in radical operations for pus tubes, removed both ovaries and tubes, sterilized the ovary for surface infection in an alcohol flame or by dipping in tincture of iodin, and planted it between the peritoneum and the abdominal fascia. The menstruation ceased for four or five months, and symptoms of the menopause developed; then menstruation started and continued normally. My colleague, Dr. Sistrunk, has treated a number of cases in this manner.

The effect of the internal gonadial secretion on the breast is marked. Beatson,[2] in some inoperable cases of carcinoma of the breast, removed the ovaries, and most remarkable changes in the breast took place, with disappearance or partial disappearance of the cancer. The autonomic (sympathetic and parasympathetic) nervous system, acting with the hormones (internal secretions) of Starling,[3] controls the functions of the reproductive organs. The sympathetic fibers can be directly traced, and in some of the lower animals (Tasmanian devil) branches of the vagus parasympathetic nerve pass to the horns of the uterus, showing direct cranial connection. The nodes of Keith,[4] acting through the nonstriated uterine muscle, introduce physiologic connections between the visceral and genital functions.

The internal secretion of the ovary generally is closely related to the endocrine system, and widespread effects are manifest on the cessation of the ovarian function. In several instances I have noted that the ovaries maintain their normal size and apparently function after the removal of the uterus. Twenty-two years after performing a vaginal hysterectomy on a young woman for sarcoma of the uterus, I had occasion to open the abdomen. I found the ovaries apparently normal. The lesson to be drawn is that the removal of the ovary is seldom indicated for inflammatory diseases, and a sufficient amount should be saved, if possible, to continue the menstrual function. The transplantation of ovaries from one woman to another, so far as I know, has not been followed by return of menstruation or impregnation. A few suggestive instances have been reported, however, by Franklin Martin[5] and by Robert Morris.[6] Morris suggests that ovarian tissues may have been left in the ovarian ligament at the time the ovaries were removed, and this nonfunctioning ovarian tissue may have been stimulated to action by the introduction of ovaries from another woman. He relates some experiences to confirm this opinion.

The thoughtful surgeon conserves menstruation when the thoughtless operator sacrifices it. On one occasion, a good many years ago, when I was operating for extra-uterine pregnancy on a young woman greatly exsanguinated, I rapidly removed the ovary with the tube in order more quickly to secure a pedicle. Two years later this patient returned with benign cystadenoma in the remaining ovary. At the age of 24 she was deprived of the right to motherhood, and her menstrual function was lost. In tubal pregnancy it is seldom necessary to remove the ovary. I have operated for double dermoid cyst of the ovaries in many cases in which the larger cyst had destroyed the entire ovary, but I have been able to enucleate the smaller cyst from the other ovary, and to save sufficient ovarian tissue so that menstruation may continue. Without discussing further conservation in benign diseases of the ovaries and tubes, I may add that I have seen acute cases of gonorrheal infection of the tubes, including the ovaries and pelvic peritoneum, spontaneously subside, and several years later the patient has become a mother. It is often best not to molest the chronic inflammatory remnants left after such infections have subsided.

Independent of its rôle in reproduction, the menstrual cycle has a striking effect on the female during the period between puberty and the menopause. All surgeons have seen the shrinkage of the uterus, shortening of the vagina, and trophic changes following ovariectomy. The nervous and psychic changes of the normal menopause are aggravated in young women by operations that check the menstrual flow. *It is probable that menstrution itself has some important endocrine function.* The effect on the patient is essentially the same whether menstruation is stopped by removing the ovaries and leaving the uterus, or removing the uterus and leaving the ovaries. Conservation of the reproductive function is of first importance, but conservation of the ovary for the continuance of its internal secretion and its effect on the production of menstruation is second only to the reproductive function; and even if reproduction is impossible, conservation of the ovary or some portion of it for the sole purpose of continuing menstruation is of greatest importance. The estimation of the probable success of an operation from the patient's standpoint may turn on whether or not the menstrual function is to be lost.

Sacrifice of the reproductive and menstrual functions, however, is not confined to removal of the ovaries, but is concerned in operations on the uterus, especially for myoma. Hysterectomy has become an operation so thoroughly organized that almost every operator has some special bit of technic in connection with it of which he is proud, and many a uterus is unnecessarily sacrificed when a myomectomy would be the better operation and would save both the menstrual function and the possibility of motherhood. Hysterectomy is seldom necessary for benign myoma in a woman under 35, and demands an excellent reason in a woman under 30. At 45, hysterectomy is probably the best procedure. Sutton has shown that 10 per cent. of women who require hysterectomy for fibroids after 50 have coincident malignant disease.

RESULTS OF MYOMECTOMY

It has been argued against myomectomy that it is the more dangerous operation; but in our series of 741 cases the mortality was a shade under 1 per cent. (0.9). Abdominal myomectomy was performed in 617 of the 741 cases, with three deaths, or 0.5 per cent. There were four deaths in the 124 vaginal myomectomies, about 2.7 per cent. Every patient dying in the

1. Tuffier, T.: Transplantation of Ovaries, Surg., Gynec. & Obst. **20**: 30-34, 1915.
2. Beatson, G. T.: The Treatment of Inoperable Carcinoma of the Female Mammae, Glasgow M. J. **76**: 81-87, 431, 1911.
3. Starling, E. H.: The Chemical Control of the Body, J. A. M. A. **50**: 835-840 (March 14) 1908.
4. Keith, A.: The Differentiation of Mankind into Racial Types, Lancet **2**: 553-556 (Sept. 27) 1919.
5. Martin, F. H.: Ovarian Transplantation in Lower Animals and Women: Review of the Literature and Bibliography, Surg., Gynec. & Obst. **13**: 53-63, 1911.
6. Morris, R. T.: A Case of Heteroplastic Ovarian Grafting, Followed by Pregnancy and the Delivery of a Living Child, Med. Rec. **69**: 697-698, 1906.

hospital, irrespective of the cause of death or the length of time following operation, is counted as dying from operation. Following myomectomy in these 741 cases, thirty-three women raised one child, eleven raised two or more children, and fifteen were pregnant at the time the investigation was made. Twenty-three married women who were sterile before operation had one or more children after operation.

Nineteen pregnant women were subjected to myomectomy because of acute degenerative changes in myomatous tumors, and all lived. Thirteen of the pregnancies were intra-uterine. Eleven of the patients went to term and bore living children; two miscarried within a week after operation, but in each, miscarriage was imminent at the time of operation; three showed signs of impending miscarriage previous to operation which subsided after the removal of the tumors. Six women had extra-uterine pregnancies at the time the myomectomy was performed; in all, rupture had already occurred, with large pelvic hematoceles, one with a dead fetus of four and one-half months. The myomectomies and the operations for the extra-uterine pregnancies were performed at the same time in these six cases; it seemed possible that the presence of the tumors was responsible for the ectopic pregnancies. One of the patients has since borne a child.

It has been asserted that frequently tumors develop after myomectomy. Nineteen of these 741 patients (2.56 per cent.) required secondary operations; in eleven cases the operation was performed five or more years after the myomectomy, and in one, thirteen years afterward. One of the nineteen patients had a child after myomectomy. The majority of the secondary operations were performed for inflammatory disease. It was difficult to obtain accurate pathologic data of secondary operations, since more than half were performed elsewhere; but none of the patients had developed malignant disease. In many of the cases in which the second operation was performed for recurrence of the fibroids, the operation could today be avoided by the use of radium. In none of the cases reported were the recurring tumors large, because the patients, being aware of the former condition, were on the alert. Hysterectomy was usually performed, because the patient had been carried along by the myomectomy to the age in which a radical operation is of less importance.

In many cases of myomatous disease it is not possible to save a uterus that will bear a child; but in cases otherwise suitable, one ovary and enough of the endometrium can be saved to continue the menstrual function. I have removed all of one wall of the uterus and one ovary and tube and made plastic restoration; the patients have continued the function of menstruation normally for years.

In a former paper[7] I noted the removal, by myomectomy, of a large tumor which had grown from the cervix. In the process of removing the growth, the fundus of the uterus was completely separated from the cervix and vagina, but I was able to anastomose the uterus to the cervix with catgut sutures with perfect results. I have had one other case of the same kind. If the patient has had hemorrhages and a myomectomy is performed, the endometrium should be opened, inspected, and thoroughly curetted under the eye. In my earlier cases I did this with a good deal of hesitation, fearing to infect the uterine wound; but no such infection has occurred. The endometrium covering a submucous fibroid is atrophic. Cancer begins in the hypertrophic mucosa in the vicinity of the tumor, and the danger of cancer of the body of the uterus is increased by fibroids. In 1919, in an examination of 4,000 specimens of myomas of the uterus in our surgical museum, Evans[8] found seventy-two malignant and related nonepithelial tumors of the uterus, thirteen definitely and eleven potentially sarcomatous, and forty-eight cellular tumors with malignant possibilities. He showed that by counting the mitotic figures in the cell nuclei, the chances of cure could be predicted; the giant cells are probably a defense and not a malignancy. The sarcomatous growths may be multiple; they are yellowish rather than glistening white, and on section they are softer than fibroids, and do not enucleate readily. The careful surgeon seldom makes the mistake at the operating table of believing them to be myomas and attempting myomectomy. If so, the frozen section will demonstrate the error before the operation is completed.

Radium must justly be considered, in selected cases, a competitor of hysterectomy, but it has no competitive standing in cases suitable for myomectomy. When bleeding necessitates interference in the menopause period, radium has a remarkable field of usefulness. If the tumors are large, coming well up into the abdomen, and are caused to disappear by the use of radium, the menopause is brought about. Massive doses of radium usually destroy the function of the ovaries and uterus, leaving these nonfunctioning organs to await an uncertain future. We must sharply distinguish between nonoperation and conservation. Radium may be even more destructive than hysterectomy, as in 50 per cent. of hysterectomies one ovary, and in 25 per cent. both ovaries, can be saved. It must be remembered, too, that at middle age 12 per cent. of white women and 30 per cent. of colored women have myomas. Every surgeon has observed, over long periods of time, women with multinodular myomatous uteri who have had no symptoms, and often have raised families. The mere presence of small to moderate sized, symptomless myomas that can be watched by physicians does not indicate operation, or treatment of any kind; many are now having radium treatment. I am convinced that this is not wise. While menstruation usually returns within a few months, if may fail ever to reappear even after the use of a moderate amount of radium.

HYSTERECTOMY FOR UTERINE MYOMA

I believe that total hysterectomy is a wise procedure if it can be performed safely, and usually it can. Leaving the cervix leaves an average cancer liability. We have seen twelve cases of cancer occur in the left-over cervix after supravaginal hysterectomy. Removing a cone of mucous membrane of the cervical canal from above, or plunging the cautery through the cervical canal to destroy it, is not sufficient. Peterson[9] has shown that only one third of the cancers of the cervix begin in the cervical canal (adenocarcinoma). Two thirds of the cervical cancers are epitheliomas

7. Mayo, W. J.: Some Observations on the Operation of Abdominal Myomectomy for Myomata of the Uterus, Surg., Gynec. & Obst. **12**: 97-102, 1911.

8. Evans, N.: Malignant Myomata and Related Tumors of the Uterus (Report of Seventy-Two Cases Occurring in a Series of Four Thousand Operations for Uterine Fibromyomata), Surg., Gynec. & Obst. **30**: 225-239 (March) 1920.

9. Peterson, R.: Age Distribution and Age Incidence in Five Hundred Cases of Cancer of the Uterus, Surg., Gynec. & Obst. **29**: 544-553, 1919.

originating in the vaginal parts of the cervix. After total hysterectomy, the patient seldom complains of local trouble. If the cervix is left, however, a foul, irritating leukorrhea sometimes results from degenerative changes in the mucous glands of the cervix. Shrinkage of the vagina appears to be greater after subtotal than after total hysterectomy. It seems as if nature, in the effort to shrink the cervix following supravaginal hysterectomy, is stimulated so greatly as to increase the shrinkage of the vagina as well.

Russell [10] has called attention to the advisability of opening the abdomen, drawing up the uterus, and opening the anterior wall to expose the endometrium for examination in certain cases of prolonged uterine hemorrhage without apparent good cause. Since Russell's observation we have had occasion to do this twenty-six times in young women, and thus have been able to save the uterus. I have found polyps in one horn, which could not be reached with the curet, and small submucous fibroids. In a young woman who has hemorrhages from uncertain cause, exploration of the cavity of the uterus through the abdomen is preferable to radium, and should precede hysterectomy in doubtful cases.

CONCLUSION

I would reiterate that conservation of the menstrual function is of the utmost importance even if pregnancy is not possible, and that the surgeon who faces the necessity of removing the uterus or the ovaries, and the bringing about of all those endocrine changes attending the procedure, is taking a serious responsibility which must not be assumed lightly. The heredity of the patient is responsible for the nervous instability, but the operation may be the match which lights a fire, in the ashes of which the patient finds herself unable to readjust her life to her living condition.

ABSTRACT OF DISCUSSION

DR. C. JEFF MILLER, New Orleans: I am in accord with Dr. Mayo regarding the conservation of menstrual function, and the necessity of a more conservative attitude toward pelvic pathology. The thoughtful surgeon hesitates to remove ovaries unless they are hopelessly diseased, but we are just as radical in the treatment of fibroids of the uterus. Removal of the uterus is as radical, so far as function is concerned, as removal of the ovaries, and is equally as distressing to the patient. I agree with Dr. Mayo that myomectomy can be performed in many cases in which hysterectomy usually is done. I have had a sufficient number of pregnancies result after myomectomy to prompt me always to review a case with the view of performing myomectomy in preference to hysterectomy. We were formerly taught that myomectomy carried a slightly higher mortality rate than supravaginal amputation, chiefly owing to the risk of hemorrhage and occasional infection when the uterine cavity was opened. Later statistics will show that this was a defect in technic which has been overcome. During the past four years, I have performed more myomectomies than formerly, for the reason that if myomectomy failed to control excessive bleeding, radium could be used to complete the cure without the necessity of a second operation. In some case I have removed the entire musculature, preserving enough of the mucous membrane to conserve menstruation. Several patients developed a metrorrhagia, and sometimes menorrhagia which required further treatment.

Dr. Mayo is also correct in stating that total hysterectomy is preferable to a supravaginal amputation. If the proper technic is followed, total hysterectomy requires no more time, there is no greater risk of postoperative hemorrhage, and convalescence is decidedly smoother. I have employed radium in the treatment of fibroids for six years, and I am enthusiastic as to its results in properly selected cases. But, until we know how much permanent damage is done by radiation, we should consider its use in young women as being probably more radical than myomectomy. I advise myomectomy for all young women, especially if the growth is a single one. It is necessary to produce an amenorrhea in order to cause shrinkage of a fibroid, and as yet we cannot gage the dosage with sufficient accuracy to warrant its indiscriminate use in young women. As to the management of cystic ovaries: surgeons do not follow up their cases if they continue to resect ovaries. Only in exceptional instances should ovaries be resected. As a rule, the ovary is sufficiently involved to justify its removal, or it is healthy enough to let alone. In certain cases of serious pelvic infection where both tubes are removed, and the ovaries are involved to such an extent that it is not safe to leave them, transplantation of portions of an ovary will preserve menstruation for an indefinite time, or sufficiently long to allow of a gradual menopause without the uncomfortable results that so frequently follow abrupt cessation.

DR. JOHN O. POLAK, Brooklyn: Five years ago I reported the end-results of conservation of menstruation in connection with conservation of ovarian function. My observations are in accord with Dr. Mayo's: Ovaries are either damaged or not damaged beyond chance of regeneration. Most of the damage produced in these ovaries is due to the circulatory disturbance which is produced by the associated lesions. When this is corrected these ovaries regenerate themselves, and the so-called multicystic ovary, as large as a walnut, prolapsed in the pelvis, does not necessarily need to be removed. They have been removed only because of lack of knowledge of the pathology. Furthermore, it takes more than the leaving of an ovary to satisfy a woman that the psychic effect of the actual occurrence of the bloody discharge had a great deal to do with the comfort or discomfort of the woman. Where possible, it is advisable to retain a portion of the uterus, with its uterine mucosa, or when leaving a portion of the ovary, or even both ovaries. In cases of fibroid tumors, when the uterus is removed, leaving an ovary or both ovaries, the variations in blood pressure studies are higher than in those cases in which a portion of the uterus is preserved which produces a balance in the ovary and the other internal secretions.

DR. ROBERT T. MORRIS, New York: Conservation of the menstrual function has been overlooked in our zeal to do the right thing for the patient. Conservation of the menstrual function may often be obtained by ovarian grafting—when we remove an ovary in a mass with other structures, if a part of the ovary be placed back anywhere within the patient's economy. The time is coming doubtless when we shall be able to do heteroplasty. The heterograft is destroyed by antibodies and we may be about to make antibodies to meet these antibodies. We are just about on the verge of knowing something about that subject. Many men have argued in favor of the entire removal of the uterus in cases of Neisserian infection with its terminals. Why cannot we sometimes in confidence tell the patient frankly and fearlessly every feature of her case? Tell her the dangers of leaving a part of her uterus, the possibilities of a pregnancy if we leave the uterus, or the larger part of it. The day has passed when we cannot lay our problems before our patients.

DR. ALBERT J. OCHSNER, Chicago: I agree with Dr. Mayo. There is, however, this feature to be borne in mind. Some years ago I had charge of the surgical material in a hospital in which there was practically always reinfection in cases operated for pelvic infection unless the uterus was removed. At present there is practically never a reinfection because the patients belong to an entirely different social group. In the one case the hospital was supported by the wealthy women of the city and many of the patients treated there did not earn an honest living but depended on vice and charitable citizens. At the expense of these good people they were put into condition to take up again their

10. Russell, W. W.: Remarks on the Treatment of Tuberculosis of Uterus and Fallopian Tubes, Ann. Surg. **28**: 468-471, 1893.

vicious service and they were practically certain again to become infected. In that class of patients in our city hospitals and in the hospitals supported by charity the menstrual function should be abolished by the removal of the uterus. So far as the difference in the mortality between hysterectomy and myomectomy is concerned, I have found that many of the deaths are due to pulmonary thrombosis. The percentage of pulmonary thrombosis in these cases varies from 0.1 per cent. to 2 per cent. The pulmonary thrombosis is very largely due to the lack of perfect hemostasis. Some years ago Kelly pointed out a simple method of securing hemostasis in myomectomy by placing one suture 1.5 cm. beyond either end of the incision in the uterus. Several years ago Professor Bue of Montevideo pointed out the fact that by placing a purse string suture over the entire field at the conclusion of a hysterectomy, whether this be a supracervical or a complete hysterectomy, the same result is obtained—no hemorrhage, no blood clot, no raw surface, a perfectly dry wound. This one feature reduces the mortality from pulmonary thrombosis enormously.

DR. WILLIAM J. MAYO, Rochester, Minn.: The discussions indicate that general surgery interests all surgeons engaged in the surgical specialties, and that the so-called gynecologist is simply a general surgeon who limits his work but not his interests. About twenty years ago, Dr. Ochsner told me that if I did not tie my ligatures so tight in my myomectomies, I would not have any postoperative trouble. I followed his advice and did not again have cause to worry over these unfavorable symptoms.

SPONDYLITIS AND ABDOMINAL PAIN

WITH A DISCUSSION OF NERVE-ROOT SYMPTOMS SIMULATING VISCERAL DISEASE *

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Disease involving the articulations of the spinal column has occurred in human beings since remote times, as shown by examinations of Egyptian and Nubian remains dating back as far as 4000 years B. C. In addition, present-day postmortem investigations indicate that arthritis of the spine is not at all infrequent. In spite of these facts, one is distinctly impressed by the small number of cases that have been reported in the literature. Guffey,[1] in 1905, was able "with considerable difficulty" to find reports of only 131 cases of ostearthritis of the spine. McCrae,[2] in 1909, reported a series of eighty-one cases of spondylitis secured from the records of patients in the Johns Hopkins Hospital, together with a number personally observed elsewhere. In the last few years, however, the extensive employment of roentgen-ray examinations has emphasized the frequent occurrence of spondylitis. The orthopedist has taken prompt cognizance of these roentgen-ray studies of the vertebrae, and by him the condition is regarded as a rather common affliction. It is a question, however, whether the internist and the surgeon also realize the incidence of spondylitis and its definite relation to clinical problems.

In the last seven years (1913-1919) the diagnosis of hypertrophic spondylitis has been made in eighty-seven patients seen in my consulting room, and other instances of this condition have passed through my clinics in the hospitals and outpatient department of the Medical College of Virginia. I must confess that somewhat over half of the private cases have been recognized in the last two years.

Of this series of eighty-seven cases of spondylitis, forty patients complained of abdominal pain. In seventeen of these forty cases, the presence of visceral disease could be demonstrated, and the rôle played by the spondylitis was either questionable or negligible. In twenty-three patients, however, careful and complete studies seemed to exclude visceral disease as the cause of the patients' complaints. These twenty-three cases of spondylitis form the basis of this article.

The production of pain in spondylitis varies according to the extent and location of the inflammatory process in the spinal joints. This arthritis is frequently associated with hypertrophy of bone, atrophy of cartilage, and calcification of ligaments. As a result, there may be pain and muscle spasm in the back, limitation in the movements of the spine, and the gradual development of rigidity. If the arthritis involves the articulations of the ribs with the vertebrae there is likely to be severe pain on breathing, or even complete absence of thoracic respiration. Of particular interest, however, is the involvement of the nerve-roots by extension of the inflammation or by direct pressure of the exudate and new-bone formation.

Pressure on the nerve-roots in spondylitis, or their involvement by extension of the inflammation, gives rise to more or less pronounced sensory disturbance, characterized by pain in the distribution of these nerves. This pain may be perceived in the back, shoulders, hips or extremities, or it may be referred to the thorax or abdomen. The character of the pain varies greatly from a dull aching or drawing sensation to the most agonizing paroxysms. Certain patients with spondylitis suffer little or no pain in the back and make absolutely no mention of stiffness or other disability, while the referred symptoms may be pronounced. The thoracic, abdominal, brachial and sciatic pains of spondylitis may occur on one or both sides of the body; if bilateral, however, they are generally more severe on one side.

The referred pains of spondylitis are increased, as a rule, by movements of the body, especially walking, stooping or bending, and are promptly relieved by rest in the recumbent posture. In other instances the pain occurs in the night after the patient has been sleeping, and is attributed to relaxation of the accompanying muscle spasm, which acts as a guard or splint against sudden movements in the waking hours. Spondylitis occurs occasionally in persons who complain of no symptoms, either local or referred.

The involvement of the nerve-roots in arthritis of the spine was emphasized by some of the earliest writers on the subject. In fact, the preponderance of nervous symptoms in certain cases led von Bechterew, in 1892, to separate a special type of spondylitis, characterized chiefly by referred symptoms, such as pain, paresthesia, muscular atrophy and paralysis.[3] That he regarded this syndrome as primarily a nervous disease, with secondary involvement of the spine, is now only of historical interest.

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* Read before the Section on Practice of Medicine at the Seventy-First Annual Session of the American Medical Association, New Orleans, April, 1920.

1. Guffey, D. C.: A Collection and an Analysis of the Reported Cases of Osteo-Arthritis of the Spine, Univ. Penn. M. Bull. **18**: 250, 1905.

2. McCrae, Thomas: Osler's Modern Medicine, Philadelphia, Lea & Febiger **6**: 534, 1909.

3. A discussion of von Bechterew's views, together with a good account of the pathologic and neurologic features of hypertrophic spondylitis, is given by Rhein, J. H. W.: Pathologic Report of the Nervous System in a Case of Spondylose Rhizomelique, J. A. M. A. **51**: 463 (Aug. 8) 1908.

The fact that the nerve-root pains of spondylitis may simulate visceral disease is quite obvious. That actual confusion in diagnosis may occur, however, is not generally recognized. After a somewhat detailed search of the literature I have been able to find only five references to such a contingency. Chute,[4] in 1904, reported five cases of arthritis of the spine with referred pains imitating lesions of the kidney, prostate or seminal vesicles. Smith,[5] in reporting sixteen cases of spondylitis in 1907, mentioned that one patient had undergone appendectomy for the relief of abdominal pain, which was subsequently shown to be due to the referred nerve-root pains of spondylitis. In 1912, Dickson and O'Neal[6] gave the histories of three patients who suffered from both visceral disease and vertebral arthritis. In each instance, operation was performed, with removal of gallstones in one case, a kidney stone in a second case, and the repair of perineal lacerations in the third case. The persistence of symptoms in each patient led to the subsequent discovery of spondylitis. In two of their cases the nerve-root pains were acute and similar to tabetic crises. In their conclusions they emphasized the fact that "no examination (of a patient) is complete without a careful inquiry into the condition of the spinal cord and spinal column." Recently Allan and Squires[7] have reported two cases of spondylitis, in one of which the patient was subjected to a laparotomy for supposed gallstones. Finally, a good discussion from the roentgen-ray standpoint is contained in the recent article by Blaine.[8] This author lays particular emphasis on the fact that nerve-root pains may exactly simulate the acute suffering of renal lithiasis. The article is illustrated with roentgenograms of three patients with spondylitis in whom the clinical diagnosis of renal calculus had been made.

ILLUSTRATIVE CASES

As mentioned above, out of a series of eighty-seven personally observed spondylitis cases there were twenty-three patients who complained of abdominal pain, in whom visceral disease could apparently be definitely excluded as the cause of their suffering. In order that this report may not be too lengthy, I have abstracted below the histories of six of these cases. In Case 1 the roentgenogram of the spine showed no gross changes. The clinical findings were typical, however, of acute arthritis, secondary, apparently, to a pyogenic infection of the skin. The nerve-root pains were of a most severe character in Cases 1, 4 and 5, while Cases 3 and 6 illustrate the vague abdominal distress that may accompany arthritic changes in the spine. Cases 2 and 4 were subjected to laparotomy, with only a postoperative discovery of the spondylitis. Surgical treatment had been advocated in Cases 1 and 5 prior to the establishment of the diagnosis of vertebral arthritis. A seventh case, recently seen in my clinic at the Virginia Hospital, is reported because of its extraordinary interest. In all the clinical material at my disposal, both private and institutional, referred pains due to spondylitis have been much more frequently encountered than the visceral crises associated with tabes dorsalis and other organic diseases of the spinal cord itself.

CASE 1.—*Clinical Summary: Severe pain in left back and flank, with acute exacerbations imitating renal colic; urine negative; two roentgen-ray examinations revealed no calculi in urinary tract; roentgen-ray examination of spine also negative, but clear clinical evidence of spondylitis; complete relief followed orthopedic treatment.*

History.—Mr. W. (3575), aged 17, student, seen Jan. 21, 1913, whose complaint was pain in the left flank and back, had been in very good health, with no history of acute infections until the summer of 1911, when he began to suffer with boils, which had been very troublesome. He was weak and had felt bad ever since the furunculosis started. Oct. 11, 1912, he was suddenly seized with an agonizing attack of pain in the left flank, for which he was given large amounts of whisky and three hypodermics. He was at school in North Carolina at the time, and his attack was considered to be kidney colic. The urine was examined and was said to show no albumin, pus or blood. He had no urinary disturbances except that he believed he passed an excessive amount of urine. He had no herpes. For five weeks after this acute attack he suffered with more or less pain in the left back and flank, and had some nausea. Roentgen-ray examination during this period disclosed no renal calculus. Jan. 16, 1913, he had a second similar acute attack and was given six hypodermics. He said that his back had continued to hurt; also that he could not walk or run well because of increasing the pain. He had had pains beneath the costal borders on both sides of the body, also pain across the small of the back about as severe on one side as the other.

Examination.—Complete physical examination was negative, except as follows: The skin showed considerable acne, and there was general abdominal tenderness, more marked on the left side. The patient handled himself stiffly. The lower dorsal and lumbar spine was very tender and showed marked restriction of motion. There was no kyphosis or scoliosis. The slightest jarring caused pain in the back. The reflexes were normal.

Examinations of the blood and urine were negative.

Stereoscopic roentgenograms of the spine disclosed no gross disease. Roentgenograms of the urinary tract revealed no evidence of calculus in kidneys, ureters or bladder.

Course.—The patient was referred to the orthopedist, who concurred in the diagnosis of acute arthritis of the spine with root pains. Under appropriate orthopedic treatment the patient was promptly relieved of his pains, and subsequently went on to a complete recovery.

CASE 2.—*Clinical Summary: Sharp pain in abdomen when up and about; one attack of acute pain in left hypochondrium; patient's back overlooked in examination, as were also significant findings on roentgenograms; operation and removal of grossly diseased appendix; persistence of pain and postoperative discovery of marked spondylitis.*

History.—Mrs. P. (5590), aged 70, seen March 5, 1915, whose complaint was abdominal pain, had always enjoyed good health, and there were no facts of special interest in the past history. The present illness began about one year before with pain across the back at the waistline. She soon developed sharp pains in the abdomen around the navel and radiating to the back. These pains occurred when she was up and about or when she tried to move. She had had one attack of sudden acute pain in the left hypochondrium, associated with vomiting. This required morphin; otherwise she had had no opiates. In addition, the patient complained of pain in the neck and in the right shoulder, increased by moving the arm. She said she was comfortable when lying still, but on trying to move she developed pain through the abdomen and back. She had some sour stomach and much flatulence. Her bowels were constipated and the stools occasionally were light in color. She had had no jaundice.

Examination.—Physical examination was negative, except as follows: The patient was very thin; the systolic blood

4. Chute, D. L.: The Pain of Osteo-Arthritis of the Spine: Its Bearing on the Diagnosis of Urinary Diseases, Boston M. & S. J. **151**: 563, 1904.

5. Smith, H. W.: Hypertrophic Arthritis of the Spine, U. S. Naval M. Bull. **2**: 6, 1907.

6. Dickson and O'Neal: Osteo-Arthritis of the Spine: With a Report of Three Cases Complicating Disease of the Abdominal Viscera, Surg. Gynec. & Obst. **15**: 552, 1912.

7. Allan, W., and Squires, J. W.: Spondylitis Chronica Ankylopoietica, Southern M. J. **11**: 373 (May) 1918.

8. Blaine, E. S.: Renal and Ureteral Stone Symptoms in Spondylitis, Am. J. Roentgenol. **4**: 122 (Jan.) 1917.

pressure was 160 and the diastolic 106; the abdomen was retracted, with thin walls, shadows of the intestines being visible, and the superficial veins distended. An irregular mass was present in the right flank (thought to be either a tumor of the kidney or ascending colon, or possibly a Riedl's lobe of the liver). No note was made of examination of the spine.

The hemoglobin was 65 per cent.; otherwise blood examination was negative. A specimen of catheterized urine showed a heavy cloud of albumin, with an occasional leukocyte and hyaline cast.

Roentgen-ray examination of the urinary tract was negative. The liver was noted to be enlarged or displaced downward, but no mass was shadowed in the right flank.

On surgical consultation, exploration was advised, with the expectation of finding chronic cholecystitis with enlarged right lobe of the liver, or possibly malignant disease. Operation, March 10, 1915, disclosed a grossly diseased appendix that was adherent to a displaced right kidney. The gallbladder, stomach and pelvic contents were normal.

Course.—After convalescence from her operation the patient experienced a return of pain in the abdomen and back as soon as she attempted to sit up. The original roentgenograms were again studied and disclosed slight evidence of hypertrophic arthritis of the lumbar spine. A second roentgen-ray study was then made of the dorsal spine and disclosed marked hypertrophic spondylitis with almost complete obliteration of the disk between the eleventh and twelfth vertebrae. The orthopedist reported distinct rigidity of the spine, with restricted motion, pain, etc. Because of the patient's advanced age he recommended symptomatic treatment and rest in bed on a firm mattress, rather than any attempt at fixation.

CASE 3.—*Clinical Summary: Vague, distressing abdominal pains, characterized by drawing, pulling and burning sensations; no acute pain, but the patient had had a "catch" in the left hip radiating to the lower abdomen; visceral disease apparently excluded; spondylitis not suspected, but found on making roentgen-ray examination of gastro-intestinal tract.*

History.—Mrs. W. (8423), aged 59, occupation a housewife, seen, Jan. 10, 1918, whose complaint was pain in the abdomen, had had malaria years before, pleurisy twenty years before, and rather frequent tonsillitis as a younger woman, but no other acute infections. She had had two children, and no miscarriages; the menopause occurred at the of 43. There was no history of pelvic disturbances.

The patient dated the onset of her present illness to one year before, when she began to suffer with discomfort in the lower abdomen. For the last two years, however, she had had a frequent "catch" in the left hip, running across into the "bowels." The abdominal discomfort had gradually increased, and she described it as "a hard hurting and burning." She said that the intestine seemed to pull and draw, and she felt as if there were a knot in her bowels. She occasionally had pain between the shoulders and down the spine. Her appetite was good and she had no digestive disturbances, except constipation. While her pains bore no relation to meals, yet she had attributed them to indigestion and had restricted her diet; she had become weak and had lost about 35 pounds.

Examination.—The patient was thin and appeared to be weak; she had considerable pyorrhea, but the throat appeared negative; the abdomen was held rather stiffly and showed distinct tenderness in both iliac fossae. The spine was noted to be straight, with tenderness on pressure just to the left of the lumbar spine. No mention was made of the movements of the spine. Physical examination was otherwise negative.

The blood, urine, gastric contents and Wassermann test were negative.

Roentgen-ray studies of the entire gastro-intestinal tract (barium meal and barium enema) were negative. On certain of the plates, however, the lumbar spine showed marked evidence of spondylitis deformans.

Course.—The patient was referred to the orthopedist, who confirmed the diagnosis of spondylitis with root pains. After preliminary rest in bed she was treated with fixation by a plaster cast, with marked relief from her symptoms.

CASE 4.—*Clinical Summary: Recurring attacks of pain in lower left abdomen for over seven years; appendectomy and freeing of kink in sigmoid appeared to afford relief for one year; recurrence of symptoms; second study of patient disclosed arthritis of lumbar spine; pain controlled by fixation.*

History.—Mr. C. (10050), aged 49, a salesman, seen Aug. 25, 1919, whose complaint was pain in the lower left abdomen, had an attack of very severe "inflammatory rheumatism" at the age of 6 years and one attack of gonorrhea complicated by urethral stricture when 21 years old. There was no history of syphilis or of any other acute infections.

The patient first consulted us in July, 1913, complaining of attacks of pain in the lower left abdomen, together with indigestion. He said that he had had seven attacks of "acute indigestion" in the preceding eighteen months. These were characterized by agonizing pain in the lower abdomen, worse on the left side. The attacks were followed by pronounced abdominal soreness, confining him to bed for two or three days. He had some nausea and vomiting with his acute attacks, attributed to morphin that had been administered. His appetite was poor, and he complained of a frequent knot in his throat, but he had no flatulence or constipation. His attacks were likely to be followed by constant aching pain low down in the left abdomen. He stated that two roentgen-ray examinations of the urinary tract were negative and that the urine was reported to be normal.

Examination.—Complete physical examination (in 1913) was negative, except that the tonsils were enlarged and ragged, there was tenderness on palpation over the sigmoid and also tenderness over the head of the cecum, with pain on pressure which radiated toward the navel. Rectal examination was negative, but the spine was not examined.

The blood, urine and gastric contents were found normal. No further roentgen-ray examinations were made, but exploratory operation was advised. The opinion was expressed that the patient probably had diverticulitis of the sigmoid and possibly appendicitis. He was operated on through a median incision in July, 1913, and the surgeon reported that he removed a diseased appendix and freed a kink in the sigmoid.

Subsequent Course.—The patient returned to us in August, 1919, and stated that he had been relieved of symptoms for about a year following his operation. The pain in the lower left abdomen then returned. For the most part this had been a dull ache, but at times had been sharp and acute. He had also noted pains in the lower left back. These pains were increased on moving the leg, on stooping and on lifting. The pain disappeared when he sat still, but recurred as soon as he stirred about. No other symptoms of interest were noted.

Second Examination.—Complete physical examination was negative except as follows: The tonsils were large and ragged, there was receding of the gums with pyorrhea, and slight tenderness over the sigmoid. The spine showed scoliosis, with convexity to the right in the lumbar region, dorsal bowing with increased lumbar lordosis, tenderness on pressure in the lumbar region, restriction of motion on both flexion and extension, muscular spasm of the erector spinae group, and on lateral bending to the right, pain was produced in the left iliac region. There was no tenderness over the sciatic nerve, but the Kernig sign on the left was positive.

The blood, urine and Wassermann test were negative.

Roentgen-ray examination revealed ostearthritis of the lumbar vertebrae, but no bony changes about the sacro-iliac articulations. Films of the teeth disclosed no apical infections.

Course.—The patient was referred to an orthopedist, who first put him at complete rest and then applied a plaster jacket. Several months later the patient reported practically complete relief.

CASE 5.—*Clinical Summary: Attacks of acute agonizing pain on left side resembling renal colic; frequent attacks of pain beneath the right costal border imitating biliary colic; considerable pain in precordial region; no pain in back; visceral disease apparently excluded; extensive hypertrophic spondylitis present.*

History.—Mrs. H. (10246), aged 47, housewife, seen May 23, 1919, whose complaint was pain in the upper right abdomen, had had occasional attacks of tonsillitis in the past, and the tonsils were removed in 1907. She had diphtheria as a child, typhoid fever in 1903, and influenza in October, 1918. She had had no other acute infections and gave no history of arthritis except some "rheumatic pains" in hands and knees. She had had four children and no miscarriages. Hysterectomy and appendectomy were performed in 1913. About fifteen years before the patient had recurring hematuria for six weeks. Nine years before she had a severe attack of apparent kidney colic, but she does not remember on which side. Her past history was otherwise negative.

The patient dated the onset of her present illness to four years before, when she began to have attacks of "acute indigestion," characterized by severe pain in the epigastrium and beneath the right costal border. These required hypodermics for relief, and were thought to be gallbladder colic. She had several such attacks in a year's time. In the last three years she had had no acute attacks, but had had almost constant pain through the lower right chest, at times quite severe in nature. In addition, during the last four years the patient had suffered from attacks of acute agonizing pain in the left lower abdomen, radiating from flank to groin and requiring morphin. She said she had a sore place in the lower left abdomen that was like an electric button. Touching this spot produced pain that radiated all over the left side of the abdomen. The preceding fall the patient weighed 138 pounds; her present weight was 118 pounds. Her history was otherwise unimportant.

Examination.—Complete physical and neurologic examination was negative except as follows: There was some tonsillar tissue present (incomplete operation); the mouth showed considerable dental work with some receding of the gums; there was slight diffuse abdominal tenderness, and definite rigidity of the spine in the dorsal and lumbar regions; there was hyperalgesia over the right lower thorax.

The blood, urine and gastric contents were normal. The Wassermann reaction was negative on blood serum and spinal fluid. The latter showed no increase of globulin, and gave a normal cell count.

Complete roentgen-ray study revealed lipping and hypertrophic bone formation involving the third to the ninth dorsal vertebrae and the third and fourth lumbar vertebrae, with almost complete obliteration of the intervertebral space between the third and fourth lumbar vertebrae. The gallbladder region, the urinary tract and the gastro-intestinal tract (opaque meal) showed no lesions; two alveolar abscesses were found in the mouth.

Course.—The patient was under observation in the hospital from May 24 to Aug. 7, 1919. For seven weeks she was kept absolutely in bed, and during this time was remarkably free from pain. She was then allowed to get up, preparatory to having a plaster cast applied. Shortly after this she was seized with a succession of most agonizing attacks of pain, radiating from the left flank to the groin. Specimens of catheterized urine examined immediately after these attacks showed no pus, blood or albumin.

The patient left the hospital wearing a cast applied by an orthopedist and went to her home in a distant city. Oct. 2, 1919, she reported in person and had a reinforced corset substituted for the cast. She looked well, had gained in weight, and had been entirely relieved of the severe pains in the chest and abdomen.

CASE 6.—*Clinical Summary: Vague discomfort in lower abdomen described as pulling, dragging or taut sensations; periods of dull pain in epigastrium together with soreness in left chest and left hypochondrium; these symptoms occurred when the patient was up and about and disappeared when he rested in bed; no acute abdominal pain; no complaint of backache; visceral disease apparently excluded; spondylitis discovered accidentally during roentgen-ray study of gastro-intestinal tract.*

History.—Mr. E. (10295), aged 49, farmer, seen June 5, 1919, whose complaint was indigestion, had "rheumatism" in the shoulders and arms four years before which disappeared after the extraction of certain teeth. He had influenza in April, 1919. Otherwise he had had no acute illnesses and his habits were excellent; his wife had had twelve children and one miscarriage.

The patient dated the onset of his present symptoms to January, 1919, when he began to be troubled with a "taut" feeling in the lower abdomen. Shortly after this he had a slight fall, in a sitting posture; he suffered no immediate pain, but some hours later he had pain in the left side of the chest and abdomen, lasting fifteen days. In April he had a severe attack of influenza with fever for nine days and much hiccup. Following this the abdominal pain returned with marked soreness in the epigastrium and a pulling, dragging sensation in the lower abdomen, with occasional burning and flatulence. These symptoms were present every day. They were aggravated by walking about and were relieved by lying down, so that he had spent much of his time in bed. He said he could not bear any jarring of the body, and he had a tendency to hold the abdomen. His appetite was very good, and he had had no nausea, vomiting or sour stomach; but his bowels were constipated. He was about ten pounds below his usual weight of 160. Careful questioning elicited no other symptoms, and he made no complaint of pain in the back.

Examination.—Complete physical examination was negative, except as follows: The teeth were badly worn, with some pyorrhea; the brachial arteries were easily felt; the systolic blood pressure was 124; the diastolic 78; there was diffuse abdominal tenderness; the spine was straight, not tender, and showed stiffness and restricted motion, especially on lateral movements. Rectal examination was negative, and there was no hernia.

Blood, gastric contents, specimen of stool and Wassermann test were negative. The urine showed a cloud of albumin and a few hyaline casts.

Roentgen-ray studies were made of all the teeth, the urinary tract and the gastro-intestinal tract (immediately and six, twenty-four and thirty hours after eating, with screen and plates) and found negative. On two of the plates, however, a good view was obtained of the lower dorsal spine, and this showed a characteristic picture of hypertrophic arthritis.

Course.—This is not known; orthopedic treatment was advised.

CASE 7.—*Clinical Summary: Severe pains in right side of abdomen extending from flank to groin and radiating to the leg; recently similar pains had developed on left side; patient had had two abdominal operations to secure relief, with removal of gallbladder and appendix; persistence of symptoms following operation; well marked evidence of spondylitis confirmed by roentgen-ray examination; visceral disease apparently excluded.*

History.—Mr. M. (Virginia Hospital), aged 53, seen, Oct. 2, 1919, complained of pain in both sides of the abdomen. The patient's general health had been good. He had had a discharging ear as a child, and had malaria ten years before. There was no history of other acute infection, and he denied all venereal diseases.

The patient dated the onset of his present illness to an attack of pneumonia in May, 1918. On convalescing from this illness he began to suffer with sharp pain in the right flank and groin. This pain radiated to the back and also to the right leg. He described it as a dull, cutting pain, and he had taken a great deal of acetylsalicylic acid, which afforded some relief. At times the radiating pains had stopped, but he always had pain in the right groin. He had no pain on the left side until one month before. At that time lumbar puncture was performed and was followed by persistent pain on the left side similar in character and distribution to that on the right.

In December, 1918, the patient was operated on in a distant city and the gallbladder removed. In February, 1919, he was again operated on and the appendix was taken out. He was told that no definite disease was detected in either organ. About this time all of his teeth were extracted except three. There had been no change in the character of his pain, and the pains were no better and apparently no worse than they were at their onset. He had no definite

digestive disturbances, but was constipated. There were no urinary symptoms, and his history was otherwise unimportant.

Examination.—Complete physical and neurologic examinations were negative except as follows: There was moderate atheroma of the peripheral arteries, the systolic blood pressure was 120, the diastolic, 60; the abdomen showed two operative scars and diffuse tenderness, which was most marked in the lower right quadrant. The reflexes were normal. The spine showed moderate posterior bowing in the dorsal region, and marked rigidity and limitation of motion in the lumbar region.

Examination of the blood was negative except for definite secondary anemia; the urine showed a trace of albumin, a few pus cells and an occasional hyaline cast. The Wassermann reaction on the blood and spinal fluid was negative, and the latter showed no increase of globulin or cell count.

Roentgen-ray examination of the urinary tract was negative for calculus. Screen and plate study of the gastro-intestinal tract (immediately and six and twenty-four hours after eating) was negative except for evidence of slight adhesions about the cecum. Plates of the spine revealed marked hypertrophic arthritis of the second to fifth lumbar vertebrae.

Course.—This is not known. The patient was advised to put himself under the care of an orthopedist.

In this series of eighty-seven cases of spondylitis, there were sixty males and twenty-seven females.

AGES BY DECADES

Ages, Years	Cases
From 10 to 19	1
From 20 to 29	4
From 30 to 39	7
From 40 to 49	21
From 50 to 59	25
From 60 to 69	21
From 70 to 79	8

No attempt was made to tabulate the age at onset of the spondylitis, as in many instances this was too uncertain.

As to the etiology of spondylitis, one is certainly correct in assuming that it is identical with that of arthritis in general. The vertebral localization of the arthritic process is no more peculiar than the involvement of other joints of the body. The relation of arthritis to focal infections is so definite in most instances that it would seem correct to suppose that the vast majority of arthritides are due to toxic absorption with special tropism on the part of the joints.

In this series of eighty-seven patients with spondylitis, three cases seemed to be consequent to typhoid fever and four cases appeared to be secondary to a gonorrheal urethritis. Nine of the patients gave a history of preceding acute rheumatic fever, and many of the patients had had one or more attacks of tonsillitis. While it may occur in young adult life, it must be recognized that, as a rule, spondylitis is comparatively rare before the fifth decade of life. Now, it is at the age of 40 years and beyond that focal infections about the teeth become manifest in many persons. In this personal series of spondylitis cases, pronounced alveolar infection was the rule in the majority of patients. The Wassermann test on the blood serum was made in sixty-two cases, and was negative in all these patients except one. In nine obvious cases the spine was not roentgenographed. Of the remaining seventy-eight cases, roentgen-ray examination revealed gross changes in sixty-eight and was reported negative in ten cases. From a consideration of all the possible etiologic factors in this series, I believe one is correct in assuming that spondylitis may occur in early adult life as the result of certain infections, especially tonsillitis, acute rheumatic fever, gonorrhea and typhoid fever. In most instances, however, spondylitis is a disease of middle and late adult life, and is generally secondary to chronic focal infection about the teeth.

SUMMARY

The incidence of spondylitis, while familiar to the orthopedist, is not generally recognized by the internist and surgeon. The involvement of the nerve-roots in arthritis of the spine may give rise to referred pains not only in the shoulders, hips and extremities, but also in the chest and abdomen. The symptoms referred to the abdomen may simulate visceral disease, and may vary from vague discomfort to paroxsyms of acute pain. In this series of eighty-seven cases of spondylitis, abdominal pain occurred in twenty-three patients in whom visceral disease could apparently be excluded as the cause. Errors in diagnosis lead to needless operations on gallbladder, appendix and urinary tract. Spondylitis with referred abdominal pain is much more frequent that tabetic crises. Relief of the nerve-root pains is secured by proper orthopedic treatment plus removal of responsible foci of infection.

ABSTRACT OF DISCUSSION

DR. GUSTAVE ROUSSY, Paris, France: [Dr. Roussy spoke in French. His remarks were translated into English by Dr. Thayer.] Professor Roussy calls attention to the similarity of the condition described by Dr. Vanderhoof, to certain observations made in France, in young men, who on roentgen-ray examination of the spinal cord showed rather extensive lesions, spicules, spines, and stalactite-like lesions of the vertebrae. He calls attention to the difference between two types of spinal arthritis, particularly that studied by Marie, and one beginning more commonly in the shoulder joint and in the hip joint, and resulting in extensive immobilization of the spine. The actual symptoms of immobilization are not striking but the symptoms of pressure come out markedly, without the evidences of grave immobilization. He mentions the circumstance that in the rhizometic spondylitis of Marie, he was rather of the opinion that in many instances the cause was gonorrhea. Three of the cases cited by Dr. Vanderhoof may be of that type, but in many of the cases of more benign spondylitis, Dr. Roussy is uncertain as to the cause. In some cases which they observed infection may have been the cause, but in many instances, there was no evidence that infection was at the root of the malady, and no apparent cause could be found. He calls attention to the similarity between these conditions and the interesting condition described by Madame Dejerine of a hyportrophic arthritis consequent on a severe wound, particularly about the knee and of the spinal cord. He mentioned that in several of those instances extensive ossification was observed in the abductor muscles of the thighs, extending for a very considerable distance down the thigh, a change ascribed by Madame Dejerine to some trophic injury to the cord. Dr. Roussy also called attention to the relative frequency of muscular atrophy associated with spondylitis, and spondylitis due to pressure. He calls attention particularly to a number of instances in which the sternomastoid, the trapezius and other muscles in the cervical region and in the region of the shoulder have been affected, in which, on careful roentgen-ray examination, distinct evidence of the cause has been found in the spondylitis.

SIR HUMPHRY ROLLESTON, London, England: I should like to express my surprised appreciation at the large number of cases which the author recognized. It is, indeed, rather remarkable that this connection has not been noted before, because, as many of you remember, many years ago John Hilton of Guy's, who wrote so much on "referred pain,"

pointed out that caries of the spine might cause abdominal pain, and it would appear that the mechanism in which spondylitis deformans produces symptoms simulating those of disease of the gallbladder, the appendix, etc., must be exactly the same.

DR. DOUGLAS VANDERHOOF, Richmond, Va.: The chief aim of my article was to emphasize the frequency of spondylitis. In recent years I have become especially impressed by the fact that arthritis of the spine is a very common condition. There is no reason why it should not be, when we consider the frequent occurrence of arthritis in general. We are often consulted by patients with peculiar girdle pains, underneath the costal borders. When on the right side, we may think of a diseased gallbladder. When the pain is on the left side, we are not so ready to diagnose a visceral condition. We have been able to demonstrate that certain of these persons have a localized spondylitis of the dorsal spine. One should remember that in making a roentgen-ray examination of the dorsal spine, a special technic must be employed. This paper contains the report of eighty-seven cases of spondylitis seen in the course of the past seven years, including 1919. I am sure that in the first three and a half months of this year I have seen twenty-five or thirty additional cases confirmed by roentgen-ray examination. This is important, because we must recognize the incidence of spondylitis, and we must also realize that some of these persons have referred nerve root pains that simulate visceral disease. Furthermore, we must bring these facts to the attention of our students in the same way as we have been trying to impress on them the importance of testing the pupillary reaction, the knee jerks, etc., to save the tabetic from needless abdominal operations.

SUBCUTANEOUS PHLEBECTASIS OF THE LOWER THORACIC AND UPPER ABDOMINAL REGIONS *

WILLIAM GERRY MORGAN, M.D.
WASHINGTON, D. C.

In the course of the routine examination of patients during the last twenty years I have noted here and there individuals presenting a peculiar dilatation of the cutaneous veins in the diaphragmatic area of the chest and upper abdomen. These veins stand out in an irregular wreath shape form, most often occupying the right diaphragmatic area, but occasionally the splenic area. In some instances the veins extend from one axillary line to the other and down each lateral aspect of the abdomen and across the hypogastrium, thus forming a complete wreath. There are two distinct types to be noted—those in which the dilatation is in the form of telangiectasis and those which are true varices. I have used the name "phlebectasis" to designate this affection.

This condition, in my experience, is vastly more often observed in men than in women; yet it does occur in women.

From the first time I observed this down to the present I have promised myself if an opportunity offered with a sufficient number of cases at my disposal, I would take up the study of this condition and attempt to learn its significance and causal relation. We have been taught to consider this as a sign-complex of embarrassed portal circulation, either from cirrhosis, malignant disease or hepatic abscess. Similar vascular nets occur in different parts of the body, but with nothing like the uniformity of formation or the extent with which they are seen in the cases under consideration.

From my experience I am able to say that these varices are seen most frequently after the age of 30 and on up to 60 and even beyond. A definite cause of a more or less constant type must be present because of the constancy of type and the uniformity of arrangement and the constancy of location in the diaphragmatic area, and also, as I have pointed out, because of its greater predilection for men than for women.

It was necessary, in the study of this condition, to try to connect up the varices with the proper part of the vascular system, and if possible to determine whether or not the portal venous circulation was always concerned in it. This naturally has been a very difficult point to clear up, as I have never had the opportunity to have a study made at the postmortem table in one of these cases. If this point could be definitely cleared up it would pave the way for an elucidation of this entire condition.

That the condition is seen frequently in connection with cirrhosis of the liver would indicate that we must look to the portal circulation, near or remote, for causative factors in all of those cases in which no disease of the liver is to be demonstrated. This would lead us to search for causes elsewhere in the circulation even so far removed as the heart and the great blood vesseles of the chest. We have also considered the action of the diaphragm in diseases of the chest organs in its relation to this condition. And finally a study of the nervous system in these individuals has been made in relation to its bearing on phlebectasis.

When there is any interference with the return of the venous blood in the direction of the heart, whether it is in the neighborhood of the superior vena cava or the inferior vena cava or the portal vein, either within or without the liver, there is an immediate attempt to establish the circulation of the blood by means of varices which, in the case under consideration, appear in the cutaneous circulation. Just why the deeper venous circulation does not entirely take care of the necessary collateral routes is not clear.

In looking for possible causes of the disturbed circulation in these cases we should consider compression of the vena cava resulting from an enlarged aorta from one cause or another, syphiloma of the mediastinum or of the lungs, pleuritic effusions, enlarged bronchial glands, cyst or cancer of the thyroid and even hyperthyroidism, and finally, thrombosis of the vena cava itself or of its branches.

Up to the present time, as I have heretofore remarked, we have not had the benefit of postmortem studies to aid us in determining the causative factors of this condition, which, to those of us who have observed it in individuals not suffering from the grosser forms of venous obstruction in this region, is its most interesting feature.

PATHOLOGY OF THE CONDITION

As I have not given sufficient study to this condition, I am not able myself to go more profoundly into the morbid anatomy of phlebectasis; therefore I shall quote at length from an article published in 1914 by Prof. M. Villaret.[1] Villaret gives the result of many years of study of subcutaneous phlebectasis. He has

* Read before the Section on Practice of Medicine at the Seventy-First Annual Session of the American Medical Association, New Orleans, April, 1920.

1 Villaret, M.: Paris méd. **15**: 20, 1913-1914.

subdivided these varices according to their relation to the normal venous circulation. He goes on to say:

In order to simplify their readings, we have arranged schematic tracings showing the normal parietal circulation, noting on them the dilated veins observed and the direction of the current. From a large number of these tracings the following conclusions were drawn:

A. The circulation disturbance which affects the superior vena cava. The pathologic collateral circulation may be caused by compression of the superior vena cava, resulting either from aneurysm of the arch of the aorta, especially the first portion, cancer of the mediastinum or of the lung, syphiloma of the mediastinum, tuberculous tracheobronchial glands, old pleurisy, chronic mediastinitis, cancerous goiter, or even exophthalmic goiter. It may also be due to thrombosis of the vena cava or its branches.

1. Ordinary Topography: It seemed to us to be characterized by the following characteristics:

(1) Venous plexus localized over about one third of the chest.

(2) Usual dilatation of the long superficial thoracicohypogastric veins of both sides, along their entire course, but especially about the thoracic segment.

(3) Frequent dilatation of the cervico-axillary vein.

(4) Notable absence of dilatation of the superficial median xiphoid vein.

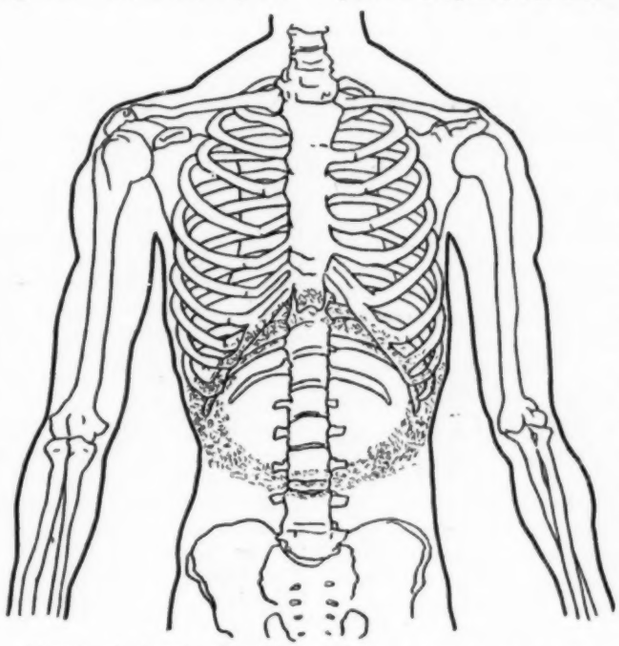
(5) Reduction of supplementary plexuses.

(6) Direction of the venous current from above downward.

(7) Frequent concomitant edema of the face, neck, chest and arms.

2. Localized Forms: When the circulation disturbance is limited to a segment of the domain of the superior vena cava, or when it is quite limited, the superficial phlebectasis may be localized in the upper part of the body on one side, shoulder or arm or middle portion of the chest at the cervico-axillary vein.

3. Mixed Forms: When, on the other hand, venous stasis of the domain of the superior vena cava is accentuated, or is simply persistent, a time frequently comes when the foregoing circulatory type is modified. The partial plexus transgresses on the portal domain or on that of the inferior vena cava, and becomes too complicated for its reading to contribute to a serious etiologic diagnosis.



Wreath of dilated cutaneous vessels in abdominal wall; taken from life.

B. The circulatory disturbance is in the domain of the inferior vena cava.

(1) Localized venous plexus, or at least clearly predominating in the region of the infra-umbilical region of the abdomen.

(2) Habitual dilatation of the middle abdominal subcutaneous veins.

(3) Frequent extension of the abnormal vascularization of the superficial iliac circumflex veins, and to the middle portion of the long tegumentary thoracicohypogastric veins.

(4) Decrease of the abundance of the supplementary plexuses, beginning with the inguinal cavity, where they arise, up to the costal regions.

(5) Absence of notable dilatation of the superficial median xiphoid vein.

(6) Direction of the venous current from below upward.

(7) Habitual concomitant edema of the lower limbs and sometimes of the external genitals.

2. Localized Forms: When the casual disturbed circulation is limited to a segment of the domain of the inferior vena cava, or of limited extent, the superficial phlebectasis may become localized.

3. Mixed Forms: More often, during the second stage, the rapidity of the appearance of which depends on the degree of the obstruction, the preceding superficial vascularization surpasses the primitive limits, in order to encroach on the portal territory. We are then dealing with the cava-porta mixed types, currently observed but not clearly described. They are found in generalized tuberculous peritonitis of the sclerotic form, and of peritoneal cancers.

C. The circulatory disturbance occurring in the domain of the portal vein.

More interesting than the foregoing are the symptomatic collateral circulations of the syndrome of the portal hypertension. They follow diverse hepatic affections of the polyphlebitis opposing the normal current of the blood of the portal vein toward the suprahepatic veins.

The collateral circulation of the thoracico-abdominal wall is very frequent and particularly decided in the course of polyphlebitis of the trunk of the portal vein. They come on suddenly, if the venous obstruction is complete, or slowly and gradually if the thrombosis is simply parietal.

Just as frequent, but much less voluminous and of a more progressive development, are the cutaneous varices following cirrhosis, especially atrophic cirrhosis of Laënnec's type. They may be absent, especially in the case of anascitic cirrhosis.

1. Ordinary Topography: (1) Beginning of the ectasis in the umbilical region, or, more rarely, in the linea alba, the collateral circulation of portal origin not being able to occur, excepting following dilatation of the venous system of the umbilicus, or of the neighboring perforating branches. Caput medusae constitutes a very decided degree of umbilical varix.

(2) Localized venous plexus, or at least decidedly predominating, in the neighborhood of the supra-umbilical and inferior thoracic regions.

(3) Habitual ectasis of the superficial median xiphoid vein.

(4) Frequent dilatation of the superficial long thoracicohypogastric vein.

(5) Possible predominance of ectases in the neighborhood of the hypertrophied liver and spleen.

(6) Absence of noticeable varices in the neighborhood of the abdominal subcutaneous veins.

(7) Direction of the current being from below downward.

(8) Rarity of concomitant edema of the lower limbs and genitals.

2. Localized Forms: (1) The first variety is formed by the exclusively umbilical and periumbilical varices.

(2) The predominating ectasis of the xiphoid median vein and the perixiphoid plexus. Often it is combined with that of a long thoracicohypogastric vein.

(3) The supplementary circulation of portal origin becomes apparent only in the neighborhood of the lower third of the thorax.

3. Mixed Forms: Often subcutaneous phlebectasis of cirrhosis undergoes variations from one period to another of the disease. The most important modification of the plexus of portal origin is when the cava type is added to it.

From the foregoing rather complete summary of the pathology of this condition, the etiology and development of cutaneous phlebectasis in the thoracico-abdominal region is more clearly to be understood.

OBSERVATIONS IN ONE HUNDRED CASES

I will now examine the clinical histories of the 100 cases which have come under my observation during the last five years, these being taken from more than 5,000 patients who were examined by me during that period, and which number certainly warrants some preliminary conclusions to be drawn.

In studying these cases individually I at first took note of every symptom and abnormal sign, however slight; but later, when considering them collectively, all those which clearly bore no relation to this condition were ruled out, and only those signs and symptoms which occurred with sufficient frequency to make it appear that they might have some significance were retained.

A summary of the tabulated findings reveals that out of 100 persons affected with phlebectasis, ninety-five were men and five women. The ages ranged from 24 to 82. Seventy-three were more than 40 years of age. Seventy-six were married and twenty-four were single. Fifty-eight led sedentary lives. Forty-two led active lives. Fifty-eight had prompt capillary circulation; thirty-seven had tardy capillary circulation, and in five the circulation was not noted. Seventy-two had normal radial vessels; sixteen firm, and twelve beady. In seventy the pulse rate was normal; in seventeen rapid, and in thirteen slow. The blood was normal in seventy-seven. Twenty-three were anemic. The blood pressure was normal in forty-seven; seventeen had hypertension; thirty-five had hypotension. The Wassermann reaction was negative in eighty-two, positive in nine, and not made in nine cases. The heart was normal in seventy-eight cases and diseased in twenty-two. The lungs were normal in ninety-one cases and diseased in nine. The liver was normal in seventy-one, and diseased in twenty-nine. The gall-bladder was normal in seventy-five, and diseased in twenty-five. The spleen was normal in ninety-eight, and diseased in two. Bowel action was normal in twenty-eight; sixty-eight were constipated; four had diarrhea. The urine was normal in eighty-seven, and adnomal in thirteen. The gastric juice was normal in forty-seven. Twenty-five had hyperacidity, nineteen, subacidity, and the condition was not stated in nine. The nervous system was normal in seventy-nine, and diseased in twenty-one. The gums were normal in twenty-seven, and diseased in seventy-three. Nutrition was normal in seventy-four, and poor in twenty-six. The roentgen-ray findings were negative in thirty-one, and were not made in twenty-one cases; in forty-eight cases they revealed some pathologic condition in the chest or alimentary tract, or both.

The past history was largely negative so far as this condition goes. Thirty-six had suffered from diseases which might have had some predisposing relation; fifty-four were entirely negative. Seventeen cases either gave a history of syphilis or had a positive Wassermann reaction. Seventy-five used tobacco; twenty-five did not. Eighteen used alcohol; eighty-two did not. Thirty-six suffered from organic diseases affecting the alimentary tract; twenty-nine, from organic diseases affecting exclusively the biliary tract; thirty-one, from organic diseases affecting the circulatory system, and nine from diseases of the respiratory organs.

RECAPITULATION

Phlebectasis of the cutaneous circulation in the lower thoracic and upper abdominal areas occurs almost exclusively in men after middle life. Of the women affected, two suffered from endocarditis, one from syphilis, one from cholelithiasis, and one from hyperthyroidism.

The conditions which are most frequently associated with phlebectasis of the abdominal walls are constipation, disturbed arterial tension, oral infection, syphilis, heart disease, aortitis, diseases of the gall-bladder, diseases of the liver, and organic disease of the nervous system.

CONCLUSIONS

From this study of phlebectasis of the cutaneous circulation of the lower thoracic and diaphragmatic areas it has been impossible to discover the exact determining cause or causes for the condition. It can be definitely stated, however, that it is an accompaniment of more or less profound pathologic changes of the midbody which without doubt affects most probably the liver, the heart or the great blood vessels.

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ABSTRACT OF DISCUSSION

DR. J. RUSSELL VERBRYCKE, JR., Washington, D. C.: Until Dr. Morgan called my attention to this peculiar purplish red capillary enlargement I paid little attention to it, regarding it as being accidental. Since then, however, I checked up my own cases, and found that this condition is characteristic. It occurs almost exclusively in males, and, as a rule, in adult life. Ordinarily, the patient is not aware of the presence of the condition. One man told me that he had had it since birth; but it is possible that he was in error. The form and distribution of these lesions is also characteristic. They seem to appear in order, most commonly over the liver, second, over the splenic area, then over both, and least commonly, in a semi-wreath shape, extending across the lower costal region, and down on each side. The cause, I am sure, is not to be found in any disturbance of the general circulation or of the viscera. The capillaries, and most of them are capillaries, are not enlarged enough to indicate any gross obstruction. These capillaries resemble those which run down over the edge of the nose in acne rosacea, and I am inclined to think that the same cause is operative in both instances. No one factor is sufficiently constant to warrant considering it etiologically. Therefore, the exact cause of this lesion still remains to be found.

DR. CHARLES F. HOOVER, Cleveland: This condition was described in the late eighties by the physician of Bismarck. He termed it a corona.

DR. LOUIS G. GENELLA, New Orleans: An Italian physician in Milan twenty-five years ago described this condition and illustrated it exceptionally well. He claimed that these abdominal varicose veins are all malignant, but that it is a very slow form of malignancy. He warned every surgeon, however, that whenever he opened an abdomen and found a marked varicose condition of the broad ligaments, to be assured that his patient would die within probably six or seven years.

DR. FRANK BILLINGS, Chicago: I became interested in this subject more than twenty years ago. Sir William Osler happened to be in my clinic when a very illustrative case of this kind was shown. He said that he had frequently found this condition in children and in certain persons of whose tissues it was characteristic.

I found that it did occur in persons who used alcohol, particularly beer, in excess. These dilated venules are at about the junction of the intercostals, the internal mammary and the epigastric veins. In cases of obstruction of the portal vein such varicosities do not occur at this site, or if they do, they are large vein dilatations. Or if there is obstruction of the superior vena cava, and consequent enlargement of the internal mammary veins, the enlargement is not like this. I cannot

accept Dr. Morgan's conclusions as an explanation of the dilatation of these venules.

DR. WILLIAM S. THAYER, Baltimore: Have you seen cases of like venules extending up the chest, all the way to the clavicle? I know of one instance, an active man, about 56, who has a line of them extending away up to his clavicle, along the costochondral articulation.

DR. WILLIAM G. MORGAN, Washington, D. C.: In a close study of between five and six thousand patients I never met a case in a patient less than 30 years of age. The definiteness of arrangement and location was characteristic. I have seen one patient who had this condition extending up the chest. That woman had a widespread thickening of the lung on that side, for which no definite cause was assigned.

MEASLES: BRAIN COMPLICATIONS *

A. L. SKOOG, M.D.

KANSAS CITY, MO.

Even in a discussion of any neural complications or sequelae that might occur in a case of measles, we are compelled to admit and even bear in mind that the exact cause of measles still remains unknown. If the disease is studied from the standpoint of the epidemiologist or bacteriologist, the logical conclusion is that the etiology can be attributed only to some organism as yet unseen and uncultivated. Thus many investigators finally conclude that some ultramicroscopic organism is responsible.

We are forced to the conclusion that complications or sequelae, whether involving the brain, spinal cord or peripheral nerves, are uncommon. Yet they are probably of sufficient frequency, and certainly of sufficient gravity, to warrant a serious consideration. Surely we have no right to consider measles a simple and harmless affection.

Relative to the frequency of the neural disorders, I find that the recent literature bearing on this subject is not much more abundant than the ancient. According to Orthalan,[1] palsies following acute fevers were mentioned by Hippocrates and Galen; but the first allusion to measles in this connection was made by Olier in 1772, who referred to this disease as "a cause of acute hydrocephalus." H. B. Allyn [2] gives James Lucas credit for reporting the first case, in 1790, in the *London Medical Journal*. Of fifty patients seen in one epidemic in 1890 by Espagne,[3] one died from a complicating meningitis with convulsions and lethargy. Wilhelm Möller [4] reports on 537 deaths in an epidemic of 1887, this being a death rate of 3.72 per cent. Among the many complications, convulsions and aphasias were rare. There were five cases of meningitis, three being reported as simple and two as tuberculous meningitis. A few of the textbooks on nervous diseases and works on internal medicine mention in a line or two the brain disorders resulting from measles, but many make no record of the subject.

A study of the literature indicates that the brain complications and sequelae of measles occur much more frequently in children than in adults, and during the convalescence much oftener than during the febrile or exanthem stage. Thus a large percentage of the disorders might be classed preferably as sequelae than as complications.

A large variety of pathologic lesions is reported as involving the central nervous system during and following measles. However, most of the cases found in the literature may be grouped under three or four headings. The meningitis group has a larger number than any other. Thomas [5] cites cases with meningitis, meningo-encephalitis, hydrocephaly, cerebral thrombosis, cerebrospinal affections, tuberculous meningitis, hemiplegia, apoplexy, hyperemia of the brain, and some others. Jürgensen [6] would doubt the accuracy of the Thomas reports, questioning often the responsibility of the measles.

I am reporting two cases which may be classed as sequelae to measles, one a cerebellar and the other a meningeal involvement.

REPORT OF CASES

CASE 1.—*A cerebellar sequela.—History.*—W. L. W., a girl, aged 4 years, whose mother was well and had had no other pregnancies, and whose family and past history was negative, had always been a robust, healthy child. Teething, walking and talking occurred at the usual age. Measles was first determined by a typical macular eruption, Koplik spots, photophobia and other manifestations, Jan. 30, 1915. Eruption and acute symptoms were practically absent on the seventh day. About the twelfth day and during convalescence the mother noticed that the child did not use her hands quite the same, there being an unsteadiness when playing with toys or performing any voluntary act. The same state was seen soon in the lower extremities so that walking was impaired, and in a very short time she could hardly get about. There was an increased irritability, and some crying. Appetite and stools were normal.

Examination.—On the third day following the first neurologic manifestations, the general nutrition was fair. The temperature and the pulse were normal. There was a slight evidence of a past macular eruption. Cerebration was fairly good. The patient was inclined to be a little sulky or obstinate. The tongue was protruded mesially, but with much coarse tremor. There was a tendency to some nystagmoid movements when looking to the extreme right or left. Other cranial nerve findings were normal. The arms and legs had fair power for individual movements, there being no true palsies. Sensory tests gave normal responses. All deep reflexes were slightly increased, the right equaling the left. The superficial reflexes were normal. The movements in all the extremities were markedly ataxic, the right being the same as the left, but the arms slightly more than the legs. The voluntary movements of the hands were so ataxic that she could scarcely hold and drink a glass of water. The incoordination in the lower extremities made standing and walking quite difficult. There was no Romberg sign. All the incoordinations were typically cerebellar in type. Cerebellar asynergia was evident. Two days later not much change was to be noted. Ten days later a great improvement was found. Seven weeks after the onset of the neurologic sequel, almost no trace of the clinical signs of involvement of the nervous system was present.

I believe that in the case just cited we have had a pathologic process involving esesentially the cerebellum. Possibly other portions of the encephalon were involved in a very minor degree. A complete recovery in a short period indicates that few or no cerebellar neuronal elements were destroyed. There was present an inflammatory process, either the result of an intoxication or directly from some secondary organism or from the hypothetic virus of measles. The termination precluded a necropsy. A spinal puncture was denied.

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* Read before the Section on Nervous and Mental Diseases at the Seventy-First Annual Session of the American Medical Association, New Orleans, April, 1920.

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2. Allyn, H. B.: Med News **59**: 617, 1891.
3. Espagne: Montpellier méd., Series 2, **15**, 1890.
4. Möller, Wilhelm: Wurzburg thesis, July, 1896.
5. Thomas, Measles, Neural Complications, in Ziemssen: Cyclopedia of the Practice of Medicine, 1875, p. 97.
6. Jürgensen, Measles, in Nothnagel: Encyclopedia of Practical Medicine, p. 330.

The only parallel case has been found after searching the literature. A. W. Fairbanks,[7] under the title "Ataxia Following Measles," cites a case indicating an involvement of the cerebellum during convalescence following measles. However, there were evidences of added involvement of the right motor neural tracts. E. Apert [8] mentions a form "rougeole ataxo-adynamique."

CASE 2.—*A meningitis complication.—History.*—L. H., a girl, aged 4 years, whose family and past history was negative, had been a healthy, well developed child. In July, 1919, I consulted with Dr. Frank Neff, who had taken charge of the case a few days previously, and about ten weeks after the attack of measles. There was present with the measles a bronchopneumonia. An otitis media followed. The child did not leave the bed after the measles and the subsequent complications. There was a state of marked helplessness, inability for any coordinated movements, and the child was inarticulate. Dr. Neff in his examination found a negative von Pirquet reaction; a white cell count of 5,400; a negative Wassermann reaction on blood and spinal fluid, and a spinal fluid clear, with no pleocytosis or bacteria.

Examination.—The patient was seen in bed, entirely helpless and speechless. She recognized no one. There was present much psychomotor unrest, with constant purposeless movements of hands and feet. There were no true palsies. There was some response to spinal stimuli. The superficial reflexes were present. The deep reflexes were present in the upper extremities, brisk at the right patellar and Achilles tendons, and feeble at the left. The Babinski and Oppenheim reflexes were questionable. The pupils responded to light and accommodation, but to a diminished degree. The eye grounds were nearly normal. Vision and hearing were undoubtedly present.

A neurologic examination in September indicated much improvement. Walking was possible.

A neurologic examination eight months after the first one indicated much favorable progress. The patient walked and played some and recognized her parents. She was unable to talk. Movements were not perfectly coordinated. Petit mal convulsions had been present during certain periods.

This patient undoubtedly had a meningitis with the other complications following the measles. The type of secondary meningeal infection was never determined. A cerebritis with a particular involvement of the cortex, as so frequently happens with meningitis, was evident. In the way of prognosis, it is reasonably certain that imbecility and possibly epilepsy will always be present.

THREE GROUPS OF CASES

In a concluding examination of the subject of brain complications and sequelae appearing in the course of or following measles, after a critical review of the reported cases and discussions in the literature and an analysis of my own few cases, I would make three groups:

1. The first group would include a certain minor number of cases in which the relationship of the measles would be merely incidental. Some of the cited cases have the onset of the brain troubles as first occurring several weeks to a few months following the eruption. Naturally the bearing of the measles infection to such sequelae can be questioned with justice. Of course, bacteria of various kinds may be harbored for a long period and under certain conditions be released as a local or general infection, when resistance in the host has been lowered by a disease such as measles.

2. The second group would include the secondary infections due to various organisms. The bacteria may be delivered to the central nervous system by the blood stream. However, the mode of invasion is undoubtedly in most instances through the cribriform plate from the nasopharyngeal cavities. This route of infection for *Diplococcus intracellularis-meningitidis* and the acute poliomyelitis virus is now well recognized. A great many more cases of meningitis follow measles, compared with all the other complicating disorders in the central nervous system. The fact that a large majority of the complications have their onset a few days following the disappearance of the eruption or during the early convalescence speaks for the importance of this second group. The interval is in accordance with the incubation period required for most of the organisms for secondary infections.

3. The third small group is a less certain one, owing to the fact that the exact etiology for measles is as yet undetermined. Clinical studies of the disease lead us to believe that the blood stream is teeming with the virus. Accordingly, the vascular channels of the meninges and brain may readily become involved. Certainly, some of the brain complications first manifested during the eruptive stage or the early convalescent period may be caused directly by the unknown virus of measles. Even some of the troubles appearing later in the convalescence may be due to this cause.

The prognosis for these brain disorders certainly depends on the brain tissue changes. If there has been much involvement of the leptomeninges or destruction of many important neurons, complete recovery is uncommon. From reports of good recoveries within from one to four months, I infer that the pathogenesis was mild. It was mild in my case with ataxia, which made a complete recovery in a few weeks; and severe in the meningitis case, in which entire recovery could hardly be anticipated.

The management and treatment of these cases depends on the lesions and the attendant deformities or deficiencies. Prophylaxis is first in importance. No unnecessary exposures to measles should be tolerated. Then the disease should be given careful attention, particularly as to preventing complications. Possibly many of the complications with meningitis reported might have been avoided had some attention been given the upper respiratory passages.

CONCLUSIONS

Cases of measles are sufficiently important to warrant careful consideration. Involvements of the brain in the course of measles, while apparently not as frequent as in other infectious diseases, are occasionally encountered. It is possible that many have not been diagnosed or recorded.

I have seen in my consulting practice and in the clinics of other neurologic consultants, certain mild neurologic or mental cases that were difficult to catalogue. This includes some with the neurasthenic syndrome. They may have originated from troubles in the brain or meninges in the course of or following measles and other exanthems. We can trace some of these neurologic disorders back to early childhood without knowing the exact etiology. I believe that at least a portion of these can be attributed to permanent pathologic residues in the encephalon or its leptomeninges, directly caused by the toxin or virus of measles or from one of the complicating secondary infections.

7. Fairbanks, A. W.: Arch. Pediat. **24**: 770 (Oct.) 1907.
8. Apert, E.: Traité de médecine et de thérapeutique, Paris, **2**, Eruptive Fevers, p. 201, 1915.

ABSTRACT OF DISCUSSION

DR. KARL A. MENNINGER, Topeka, Kan.: This paper furnishes additional evidence that we should not be too hasty in drawing a distinction between mental and physical forces. Until we know what feeblemindedness really is, it behooves us not to be too arbitrary in regard to cases of feebleminded-ness being born and not made. Kraepelin advanced the theory that there is a faulty specificity in infectious diseases. My own work in influenza has tended to show something to the effect that instead of this sort of thing being faulty specificity, it is rather a quantitative specificity. That is, whereas one physical disease would be accompanied by a single or rare mental complication, others would be accompanied by a great many complications. I do not believe that there is any specific psychosis.

DR. A. L. SKOOG, Kansas City, Mo.: We should be on our guard constantly when making neurologic examinations, especially in these cases in which the etiology is obscure and uncertain, to determine whether the actual cause of the disease may not rest in some long forgotten antecedent disease such as measles.

CONGENITAL FACIAL PARALYSIS

TWO ADDITIONAL CASES *

FRANK R. FRY, A.M., M.D.
ST. LOUIS

Dr. Michael Kasak and I [1] last year presented to the American Neurological Association the notes of a case of congenital facial paralysis of unusual interest. Two additional cases I believe deserve to be recorded, and I am therefore presenting them on this occasion. As a rather extensive bibliography accompanied our paper last year, I am omitting it here.

REPORT OF CASES

CASE 1.—Helen B., aged 1 month, was first brought to the pediatric service of the outpatient department of Washington University School of Medicine, Sept. 9, 1916. On physical examination it was evident that motility was absent in the lower right side of the face, and the upper portions seemed weak. The lower left side also seemed weak. The lower lip was everted to a considerable degree, and the right corner of the mouth was pulled down more than the left when the patient was crying. The upper lip seemed short and thin. The mother noticed the peculiar condition of the face the next day after birth, and stated that the child was not nursing well on account of it.

September 23, the patient was first examined in the neurologic clinic.

October 11, the child was first brought to the ophthalmic clinic with a slight conjunctivitis, which was improved after several visits.

March 23, 1917, the infant appeared in the otologic clinic. The examination revealed an acute otitis media on both sides, and both membranes were punctured. Within three days the acute symptoms had subsided. The patient was finally discharged from the otologic clinic as well, June 1, 1917.

Meantime the patient was seen from time to time by Dr. Michael Kasak and others in the neurologic clinic, until the time of her last recorded visit, Nov. 11, 1918. At this time Dr. Kasak and I examined her together. The child was then 27 months old. In repose, the mouth fell open with an eversion of the lower lip. The upper lip seemed relatively short. When crying, the right corner of the mouth drew down, making an unpleasant deformity. This was evidently due to the action of the platysma. The left side of the face also gave the impression of weakness, and especially when the child was crying there was an evident lack of motility in the upper portions of the face as well as in the lower, more so in the right. The mother stated that the eyes did not close completely when the child slept.[2]

In all other respects, the child seems normal. The family history furnishes no items of importance. The labor was spontaneous and easy, and at full term.

This case was in the service of Dr. Sidney I. Schwab, chief of the neurologic clinic. He saw the patient only once, as he was absent in France in war service, during the time of her subsequent visits to the clinic. The child was 6 weeks old at the time of Dr. Schwab's examination. His impression then was that there was a peripheral paralysis of the seventh nerve only on the right side. He kindly accorded us the privilege of using the clinic's notes in our report. Later on, however, the conditions as we have described them were evident, and they recall certain observations of Vogt: [3]

In peripheral facial paralysis the whole side of the face is motionless; in central and in most of the bulbar (types) the superior branch retains its movement. In congenital cases the superior branch remains motionless, while the region about the mouth retains either complete or partial motility. When this difference between the upper and lower part of the face is great, it gives a characteristic facial expression: full, protruding lips which are in contrast with the masklike, expressionless, sunken face above. The appearance of the face makes the condition often recognizable at the time of birth, and gives one the impression of an advanced atrophy or aplasia of muscles; also, the skin over the muscles is usually smooth, peculiarly shiny and colorless.

CASE 2.—E. P. L., seen Sept. 2, 1919, had a very evident right facial paralysis, associated with other interesting phenomena, a description of which I shall give after that of the seventh nerve. I am reporting it here as a congenital condition on the grounds of the convincing statements of the patient, a very intelligent, refined and educated young man. Since his earliest recollections his face has had the peculiarities now present. These he recounted in detail. In careful conversations with his mother she had convinced him and others that the condition was congenital. She had further told him that her labor at his birth was normal in all respects. His mission to me was out of the ordinary. The father of his fiancée had asked him to furnish a certificate from a specialist that his facial condition was not hereditary in character. He had gone about this conscientiously and systematically, by first obtaining all the data he could concerning his family history, and then presenting it and himself to me for examination, coming a long distance in order to do so. This history contained nothing bearing on the case.

The right sided paralysis is evident in all portions of the face, but more so in the lower. In going through the usual test movements the corrugations of the right forehead are only slightly less than on the left side. The palpebral fissure is about equal on the two sides, but there is a retracted and fixed appearance of the right lids in contrast to those of the left. The pulling to the left is marked, causing considerable disfigurement. On the right the lips are slightly flabby, the lower lip being somewhat everted. The whole right side of the face has a thinner and more flabby look as compared with the left side, and this is more marked in the lower portion. The condition causes the patient no disability or inconvenience of any kind that he can mention. The function of the left seventh nerve seems to be wholly intact.

In addition to this right facial paralysis there is evidently some defect in both motor fifth nerves, or at least in some

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* Read before the Section on Nervous and Mental Diseases at the Seventy-First Annual Session of the American Medical Association, New Orleans, April, 1920.

1. Fry, F. R., and Kasak, Michael: Congenital Facial Paralysis, Arch. Neurol. & Phychiat. 2: 638 (Dec.) 1919.

2. Prior to this, Dr. Kasak had studied the case carefully, and he and I had expected to include the report of it in our paper on congenital facial paralysis presented to the American Neurological Association, June 16, 1919, but owing to an accident with the notes it was omitted. The credit of its preparation belongs to Dr. Kasak.

3. Vogt, H.: Infantile Beweglichkeitsdefekte im Bereich der Hirnnerven, Handbuch der Neurologie (M. Lewandowsky), Berlin, 1911, p. 270.

of the muscles which they serve. Both temporal muscles are attenuated, giving a sunken appearance to these regions, and the contractions under the finger are feeble compared with a normal subject. The right masseter, compared with the left, has an hypertrophied appearance. This is probably, partly at least, due to attenuated superstructures. The left masseter is deficient in bulk, especially the anterior portion of it. What there is of it, however, contracts forcibly, as does the right. The lower jaw is slightly shifted to the right, and tilted slightly upward on this side, so that the teeth do not articulate regularly. The line of the lower incisors is one-fourth inch to the right of the upper ones. The lateral movements of the mandible, however, seem normal in range and strength, and the same seems to be true of its vertical force, notwithstanding the muscle defects just described. Dr. M. A. Bliss examined the patient with me and called attention to the fact that the platysma function was apparently entirely absent on both sides.

A phenomenon which greatly interested us was a very fine fibrillation, ranging in small waves about the face, almost constantly present in one region or another. This invades more or less all portions of the face below the lower eyelids and seems more pronounced on the right. The masseters appear also to be involved, especially at the acme, as it were, of the larger waves of the movement. The movements are so fine as to be noticeable only when rather close to the patient.

The musculature of all other portions of the body is thoroughly intact. When stripped, he presents a fine symmetrical appearance in this respect. The reflexes in all extremities are normal. He seems well and strong, and is very active. He was through rather intensive service for several months during the war. There is no disturbance in function of any of the ocular muscles, nor of any of the cranial nerves, except those here mentioned.

There are no sensory disturbances anywhere. Taste is not impaired on either side.

In view of these findings it would seem that the defects are nuclear.

TIDAL IRRIGATION OF WOUNDS BY MEANS OF LIQUID-TIGHT CLOSURE

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AND
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FOREWORD

The principle of liquid-tight closure was first brought to my attention late in 1917 when the wards of our military hospital were filled with cases of chronic osteomyelitis and chronic septic arthritis. The simplicity and ingenuity of the apparatus devised by the Taylor brothers appealed to us so strongly that we at once gave it a trial, and I have no hesitation in stating that the method of treatment represents a distinct advance. In the osteomyelitis cases it is valuable both before and after the operation, for the purpose of cleaning out the wounds as thoroughly as possible. After operation it was often not necessary to institute any form of treatment, as the wounds healed rapidly by granulation. But in many cases the operation was followed by inflammatory phenomena in the surrounding tissues, and by profuse suppuration. In these cases the Taylor apparatus proved of the utmost value. As soon as the signs of inflammation appeared, the rubber tank was applied and the wound filled with 10 per cent. solution of sodium chlorid. Every two hours the tank was emptied and negative pressure applied for fifteen minutes. In no instance was it necessary to keep the patient under the treatment for longer than twenty-four hours.

During 1918 and 1919 more than 200 patients were treated in this way and in all cases with satisfactory results. We have never seen such rapid improvement in suppurating wounds as occurred after the use of the Taylor apparatus.

METHOD OF TREATMENT

The tidal irrigation of wounds had its origin in France. The improved apparatus and the technic of its use were developed during the latter part of the war, in Canadian hospitals in England. Reports of cases and descriptions of the method and the appliance were published on various occasions under the caption of "liquid-tight closure." [1]

The practicability of tidal irrigation is dependent on liquid-tight closure, which renders possible the copious flushing of wounds without wetting the dressings. The wound is covered by a flexible rubber cap whose brim makes contact circumferentially with the neighboring skin. This ring contact with the skin is water-tight; and the fact of its water-tightness is the sine qua non of this system of treatment. Two tubes leave the top of the cap, the inflow connected with an elevated reservoir and the outflow leading to a waste vessel set below the level of the wound. Each tube communicates with the interior of the cap which, in turn, is continuous with the cavity of the wound. From the reservoir to the waste pail, then, we have a single "pipe line," the dilated section of which is comprised by the wound and its covering cap. This cap-covered wound is capable of containing fluid, even under considerable pressure.

Flooding of the wound is effected by closing the outflow and opening the inflow tube. Suction in the wound is brought about by siphonage; this is established by closing the inflow and opening the outflow. Thus positive and negative pressure may be alternated by the manipulation of pinch cocks on these tubes. The rubber cap is seen to distend during positive pressure and to shrink during negative pressure. There is no moisture of the dressings to suggest that the wound beneath is being flooded.

Continuous irrigation is never used. The wound is filled and left filled for a time. It is then emptied and allowed to remain under the influence of negative pressure until refilled from the reservoir. The amount of tension with which the wound is filled is gaged by the height *above* it to which the fluid extends (i. e., by the water level in the reservoir), the outflow tube being closed. The force of suction with which the wound is emptied is determined by the distance *below* it to which the fluid extends (i. e., by the vertical length of the column of fluid depending in the outflow tube), the inflow being closed. So, by altering the height of the reservoir, and by raising or lowering the end of the outflow tube, complete control over each of these phases of pressure is exercised.

Positive pressure should continue until the fluid has permeated every crevice, or until the wound can hold no more. It has been customary to allow half an hour or so for the full charge of positive pressure to invade its cavity. When wounds reek with pus and teem with germs, it would be better to treat them by frequent alternations of pressure during the first few hours. The duration of negative pressure is purely a ques-

1. Taylor, W. H., and Taylor, N. B.: Lancet **2**: 452 (Sept. 23) 1917; ibid. **1**: 671 (May 11) 1918; Canadian Army M. Corps Bull., April, 1918; Canadian M. A. J. **9**: 11 (Jan.) 1919.

tion of reaction, and should vary according to the intensity of the inflammatory manifestations present, lasting twenty minutes or half an hour in chronic cases, and perhaps only for a few seconds, between positive phases, in acute virulent infections. Likewise, the degree of pressure is determined by the nature of the wound. Negative pressure is more prone than positive to result in tissue reactions of undue severity. Such reactions are accompanied by pain, which is our signal to reduce the amount of suction. Frequently, however, this symptom of pain has been disregarded, and, though the reactions which ensued seemed rather severe, the condition of the wound, after the unwonted activity had subsided, was invariably such as to leave the impression that excessive reactions are salutary. Consideration for the patient's comfort is the chief indication for reducing suction. A very angry looking wound might have the treatment begun by using rapid alternations and insignificant degrees of plus and minus pressure, the duration and amount of each to be increased as the swelling subsides, as the wound becomes less sensitive, and as the effluent grows clearer.

No drainage tubes are used, for the simple reason that the wound itself constitutes, actually, the expanded portion of the conduit leading from the irrigator to the waste vessel, and that continuity of fluid pressure extends into every side track of this conduit, that is to say, into all the ramifications of the wound. Occasionally a small wire cage has been used to keep the mouth of the wound open, in cases showing a tendency to valve. The opening should be large enough to admit one or two fingers, and usually it is best to secure this by incision.

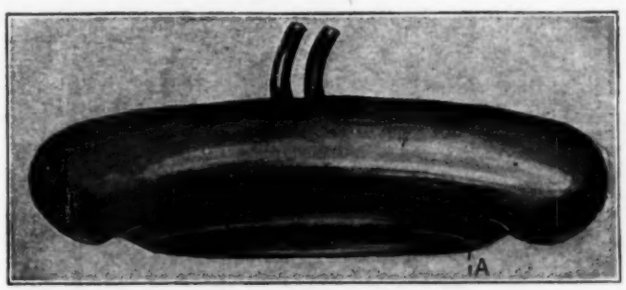

Fig. 1.—Appearance of the appliance, with the inflow and outflow tubes, the loose covering portion of the rubber, and the outer aspect of the circumferential valve (*A*).

During the night, or while the patient is sleeping, neutral pressure may be substituted by allowing a moderate amount of fluid to flow in, and clipping off both tubes while the appliance is neither distended nor collapsed. This is equivalent to a continuous bath. As a fact, so much activity may be induced in the wound during the day that it is a good practice to remove the device altogether at bedtime and apply a dry dressing.

MECHANICS OF LIQUID-TIGHT CLOSURE

Certain anatomic structures exemplify liquid-tight closure—the human lips, the eyelids, the anal sphincter. The hand is capable of maintaining closure by the intelligent application of smooth-lipped vessels to the skin, e. g., the eye bath. That there is nothing inherently impossible in the idea of containing fluid on the skin is shown by the fact that the mouth of a running faucet may be closed by the palm of the hand. Nevertheless, any attempt to bandage or otherwise fasten a vessel to the surface of the body with a view to rendering it water-tight by the direct impingement of its lips on the skin is naturally foredoomed to fail. In the first place, there is not any known system of bandaging or strapping by which the contact pressure may be evenly distributed, as the human fingers are able to distribute it, and, in the second place, there is no means of varying the amount of contact pressure as the degree of fluid pressure varies. For, even when the pressure of the contained fluid is reduced to zero, or negative pressure substituted, the same injurious amount of contact pressure must continue to impinge on the skin, and to impede the circulation of blood in the part. Previous efforts in this direction have always opposed contact, or mechanical pressure to hydrostatic pressure; whereas, with the device herein described, hydrostatic pressure is opposed by hydrostatic pressure.

The formation of a circumferential valve, operating on the surface round the wound, seemed to offer the best prospect of success in dealing with this problem. Most valves are designed to close a round aperture; but, if an area of skin should be covered by a cap, beneath which it is required to contain a quantity of fluid, the exit to be closed would not then be a round aperture; it would be the circumferential line of impingement of the edge of this cap on the skin. Accordingly, on the interior aspect of this line it was proposed to set a circumferential valve.

A general idea of the form of the device may be conveyed most conveniently by reference to a well known article of apparel to which it bears, superficially, a certain resemblance. Allusion is made to a style of headgear worn by Scotch people—the "tam-o'-shanter." If the woolen tassel which tops it be replaced by a couple of tubes; if the headband of the "tam" and its attachment to the loose covering portion be modified slightly, as shown in Figures 1, 2 and 3, and if the whole be composed of rubber, we have, to all intents and purposes, the appliance it is required to describe.

The brim of the device, which is the circumferential valve, having been adjusted to the part so as to circumscribe the wound, the loose top and overhanging portion of the rubber is covered and supported by a bandage. With the growth of positive pressure, the cap expands between the bandage and the skin, much as the bag of a blood pressure apparatus expands between the cuff and the limb to which it is applied. The greater the fluid pressure within the cap, the more securely the circumferential valve impinges. As the pressure of blood in the aorta closes the semilunar valves against each other, so the pressure of fluid in the cap holds the circumferential valve against the skin. Consequently, the contacting force with which the rubber bears on the surface of the part is never greater than the fluid pressure; yet it is always sufficient, for it varies as the fluid pressure varies. When not required, it is not operative; yet, if a sudden rise in pressure is produced in the cap, say by the patient turning in bed, the emergency is met. Its response is automatic.

The integrity of the closure that may be obtained merely by bandaging the device lightly to the skin, and without the aid of any adhesive substance, is hard to credit by those who have not seen it. Though a positive pressure of 40 mm. of mercury (roughly, a 20-inch column of water) answers every clinical requirement, the appliance has repeatedly withstood

a test pressure of 500 mm. of mercury, and withal, it is so soft and flexible that it may be wrapped around a forearm like a compress.

RATIONALE

Perfect clearance of the wound and all its ramifications is effected by the tidal movement of the irrigating fluid. Contaminated solution is replaced periodically by fresh solution. The fluid discharged into the waste pail during siphonage is a composite mixture of the large content of the cap and the small content of the wound. The purification of the latter advances, therefore, by geometric progression, assuming that an intimate commingling of these bodies of fluid occurs with each successive cycle of the flushing process.

Two chief causes are responsible for the intermixing of the wound secretions with the fluid coming from the reservoir. First we have alternating pressures. Innumerable small recesses of the wound are "milked" of their contents by the compression incident to suction, and filled again with clearer solution during the general engorgement accompanying positive pressure. During the growth of positive pressure, the influx of uncontaminated fluid is facilitated, not only by the distention incident to positive pressure, but also by the reexpansion of the wound cavity to its normal size following the cessation of negative pressure. The second cause is fluctuation, i. e., disturbances of the hydrostatic balance existing between the rubber cap and the walls of the wound. The rubber cap is distensible and collapsible; so also, though in less degree, are the walls of the wound. During positive pressure and when the part is at rest, the common body of fluid, contained both by the cap and by the wound, is in a state of hydrostatic balance as regards their respective walls. Any force (accidental contacts, weight of the bedclothes, etc.) which impinges on the cap disturbs this balance. Similarly, this balance is upset by any muscular movement that affects the conformation of the interior of the wound. Even impulses from the heart may be transmitted. It is not unusual to see the inflow tube pulsating in unison with the femoral artery.

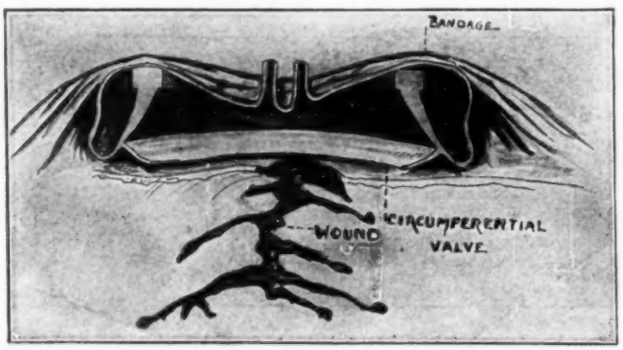

Fig. 2.—Sectional view of a ragged wound covered by the appliance. The rubber cover is sucked down to the skin surface and the wound is shrunken in, by the action of negative pressure.

By virtue of these fluctuations and the ebb and flow movement of the irrigating fluid, the walls of the wound cavity are activated. Nor is it difficult to conceive rhythmic changes in posture of the tissue elements, with alternate compression and relaxation of the neighboring lymph spaces, as occurring in response to the fluid's motility. Microbes, pus cells and other débris are teased out and dislodged from their attachments, thrown into the main body of fluid, and attenuated by progressive dilution. It is the remarkable penetrating power of a body of fluid which lies on the wound, as water may be said to lie on a sand and gravel filter through which it percolates, that is responsible for such far-reaching evacuation of its most distant recesses; for the fluid which invades these recesses under the stress of positive pressure must reappear, under the influence of negative pressure, with washings from the tissues. The tracks along which the fluid finds its way may be tortuous and narrow, may lie in the interstices formed by fragments of broken bone, or between coapted surfaces which it separates. In chronic sinuses such courses may be extremely devious and almost of capillary fineness; yet there is evidence to show that the fluid does find its way along them. No ideas that we have formed as to the penetration of wounds by solutions, when these ideas have resulted from our experience with a syringe or with multiple tubes, are at all applicable to an estimate of the extent to which fluids may be made to penetrate wounds, under hydrostatic pressure. It may be well to illustrate, diagrammatically, the principles of physics involved.

Figure 2 represents a wound covered by a liquid-tight cap, diverticula given off from the main cavity whose terminal loculi contain a little fluid, and channels leading to these loculi with their sides in apposition. The contained fluid is in a state of negative pressure. The wound walls are as completely collapsed as that particular degree of negative pressure is able to collapse them. Fluid no longer flows from the terminal loculi toward the main cavity; that is to say, the negative pressure has become static. (Strictly speaking, however, it is not quite static; for, while negative pressure is operative, the lymph which it aspirates would be flowing toward the center of the wound.) Figure 3 shows the same wound in a state of positive pressure. Here the main cavity and its diverticula contain as much fluid as that particular degree of positive pressure is capable of causing them to contain. The pressure in the terminal loculi is equal to that in the main cavity, and fluid no longer flows from the latter to the former, that is to say, the positive pressure has become static. In each instance (Figs. 2 and 3) a state of finality has been reached.

Accordingly, tidal irrigation may be defined as the slow, rhythmic transformation of the wound from the condition shown in Figure 2 to that in Figure 3 and vice versa indefinitely, or until the wound becomes sterile. That the illustrations exaggerate the distensibility of an ordinary wound cavity is neither here nor there. It must be distensible to some extent, or else its walls are rigid. Nor could this transformation have been effected by any evanescent burst of pressure. The inertia of the wound walls is not to be overcome by such momentary pressure as accompanies ordinary instillation or syringing. It required time for the main cavity to become filled; it required more time for sufficient head of pressure to accumulate within the main cavity to force the openings of the diverticula, and then a further expenditure of time for the fluid to find its way through these channels to the terminal loculi. Additional time was required for the pressure in the terminal loculi to equal that in the main cavity; all of which having had time to occur, the pressure is distributed evenly throughout, "seep-

age" of the fluid having reached the farthest recess of the wound. *It is the duration, not the amount of pressure, which is so important.*

Then, the wound having, so to speak, drunk to repletion, it is constrained to disgorge. Evacuation is inaugurated from the periphery toward the center, rapidly at first and progressively more slowly, as the limit to the collapsibility of the wound walls is reached, when static minus pressure becomes established in the wound.

There is also concrete evidence to show that the fluid actually does penetrate channels of a wound which, to all appearances, are closed. Cases were seen in which the two openings of a tunnel wound had not intercommunicated for weeks: each of these openings seemingly the outlet of a separate wound cavity. Attempts with a syringe to force fluid through from one orifice to the other, had been discontinued as futile. Such cases have served admirably to demonstrate the seepage power of fluid when activated by contrasting pressures, for, applying the cap to the larger of these openings and covering the other with gauze, if any potential channnel existed between them, the fluid would seek it out and issue eventually from the smaller opening.

This would not always occur immediately. It took three days, in one particular instance, for the fluid to ooze from the mouth of a small sinus on the opposite aspect of the thigh, which was hardly suspected as having any connection with the original wound. Possibly, in this case, the communicating channel was blocked by thickened pus, and its reestablishment followed the progressive evacuation of this material occasioned by successive onslaughts of the tidal wave. It is rather more probable, however, that tumefaction of the channel was the cause of the obstruction, and that it became permeable to fluid as the reduction of this tumefaction proceeded. Reduction of swelling, as will be seen, is a constant accompaniment of this form of irrigation. In this case it was not until the thigh, which was quite large, had become reduced in size, that the small sinus began to weep. Positive pressure, of only a few minutes' duration, more often is successful in reestablishing permeability, in which case the explanation is referable solely to the laws of hydrostatics as exemplified in Figures 2 and 3. That *blind* diverticula of a ramifying wound are invaded by the irrigation fluid may be inferred from the fact that fluid was seen issuing from these seemingly occluded channels which terminated on the surface.

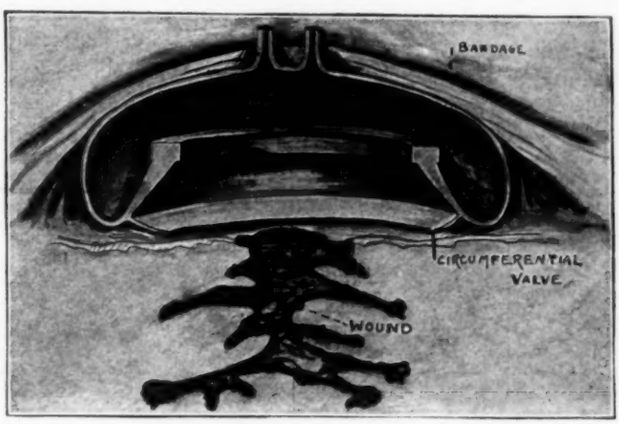

Fig. 3.—Sectional view of the same wound shown in Figure 2, in which the wound cavity is dilated and the appliance distended, by the action of positive pressure.

HYPEREMIA AND LYMPHORRHEA PRODUCED BY NEGATIVE PRESSURE

Beneficent activities are inaugurated, in the tissues surrounding the wound, which transcend in importance even the thorough cleansing of its cavity. The salutary effect of increased blood supply, within certain limits, and the value of lymp as a sterilizing agent, are so universally acknowledged as to constitute surgical maxims. A "cup" applied to the skin produces hyperemia and the same thing, on an abraded surface, causes a flow of lymph. It seems rather remarkable that so comparatively little use has been made of this knowledge in the treatment of wounds.

It is not as though the technic of applying negative pressure presented difficulties comparable with those encountered in devising means to contain fluid in a wound under positive pressure. A suitable rubber mat applied to the wound area and attached to an air exhaust would have served the purpose. Yet suction was not used. However, suction due to the rarefaction of air would need to be very powerfully exerted for a considerable period in order to draw thickened pus from a distance and, at the same time, to leave an overplus of suction to influence the flow of blood and lymph in tributary regions of the wound. Hence, negative pressure, by the abstraction of air, would be confined chiefly to the surface; also, it would interfere seriously with the proper irrigation of the wound cavity, and would be hard to regulate.

On the other hand, negative pressure transmitted through the agency of a retreating column of fluid, which is the reflux following positive pressure—this fluid being freely miscible with the wound secretions and capable of attenuating these to the consistency of water—exerts practically the same pull at the end of a long diverticulum as at the mouth of the wound. Consequently, it would not need to be more powerfully exerted at the mouth of the wound than would be required anywhere throughout its cavity. This, and the ease with which hydraulic suction can be regulated to the fraction of a degree, renders it an instrument of precision, as compared with the method of Bier.

THE EMPLOYMENT OF HEAT

The copious flushing of the wound, rendered possible by our being able to contain the fluid, secures the advantage of temperature control. Each appliance holds, according to size, from 8 to 20 ounces of fluid. This great mass of warm liquid lies over the mouth of the wound and is continuous with its cavity. Its temperature may be raised each time that a fresh supply is run in from the reservoir. This is equivalent virtually to a fomentation applied to the heart of the wound, a fomentation, moreover, that may be renewed without disturbing the dressings. To quote from Adami's monograph on inflammation, "poulticing, the employment of hot compresses, etc., are all means which have been employed for generations to 'bring an inflammation to a head'—to promote an adequate reaction."

THE FLUID USED

Antiseptics in conjunction with tidal irrigation are not contraindicated; indeed, the business of conveying the lethal dose to the haunts where microbes lurk

would be furthered by this mode of administering it. Nevertheless, and while admitting everything that has been said in behalf of antiseptics, it is to be pointed out that no valid reason for using them exists if germs can be "milked" from the tissues by mechanical means. Such being the case, the only question involved in the choice between an antiseptic and a simple fluid is whether the bacteria to be ejected from the wound shall be cast forth as dead or as living organisms. Any bacterial flora that can be reached by a germicide can be evacuated by the mechanical activity of a simple fluid, or destroyed by the reversal of the lymph flow and by the increased output of phagocytes which its activity induces in the wounded tissues. Furthermore, germs which no antiseptic, as ordinarily employed, can be made to reach at all are attracted to the surface by alternating pressures.

In the early days we used surgical solution of chlorinated soda (Dakin's solution). As is well known, this solution has a tendency to irritate the skin. This need not act as a deterrent if the area covered by the appliance is not extensive. By using a small sized appliance, covering little more than the mouth of the wound cavity proper, dermatitis may be prevented; and to do so is quite feasible, since the device functionates well on granulation tissue. Or, Dakin's solution may be used so long as the skin is not affected by it, and hypertonic saline solution substituted if dermatitis supervenes. These suggestions are for those who, naturally enough, may hesitate to discard a well authenticated antiseptic for a measure which they have not tried. One of the anilin dyes might be found more suitable to use with this appliance. When the wound is lined with the fibrinous products of inflammation, preliminary floodings with hydrogen peroxid are advantageous.

Fig. 4.—Under, or "skin" surface of the appliance.

The fluid of our preference is a 10 per cent. solution of sodium chlorid. It is cheap; it does not waterlog the tissues; it is nonirritating to the skin, and it may be used at a properly elevated temperature. Tidal irrigation with this solution has furnished the most phenomenal results.

ANALYSIS OF THE CLINICAL RESULTS

We and others have treated more than 400 cases by this method, and the results obtained have exceeded even the expectations which the logic of the procedure seemed to justify. A good proportion of the cases treated were recently infected wounds. These had not run previously such a protracted course nor exhausted the resourses of other methods, as did the chronic cases. Since, with recent wounds, the natural power to resist infection is an unknown quantity, whatever happens, even though the treatment has been the determining factor, is open to the imputation of being due to natural causes; or, at least, of not being more remarkable than might have been the case if other means had been used. For this reason we would draw attention to an analysis of the chronic cases.

The general characteristics of these indolent old wounds which, at the time tidal irrigation was begun, had earned the reputation of being incorrigible, may be thus tabulated, in a composite way:

1. The duration of invalidism, due to wound infection, varied from three to sixteen months. The average was six months. No improvement had been noted for long periods of time, as gathered from the records and the patient's statements.

2. The condition of these wounds immediately prior to the commencement of treatment was characterized by marked induration, tenderness and swelling, for a radius of several inches around an indolent wound opening, from which much pus exuded. The swelling usually involved the whole circumference of the limb. The granulations were grayish yellow. Fracture was a complication in many instances, and the condition was often associated with aching pain. In some of the cases there was a moderate amount of fever. In one instance the temperature was 103.5 and dropped to normal in eight hours. The bacterial count was on the whole, low, averaging about ten to a field. These patients as a class were thin, of a poor color, irritable and depressed. The changes in the clinical picture which ensued after treatment was begun were truly phenomenal. It was not unusual for a wound from which there had been a persistent discharge for eight or twelve months to become sterile in less than a week, and the cavity to fill with lymph and heal in two or three weeks.

Though nearly all these patients had been operated on a number of times, in other hospitals, for the removal of foreign bodies, to promote drainage or to facilitate the insertion of tubes for instillation into various side tracks of the wound, no operative measures preceded tidal irrigation save, in a few instances, widening of the outlet. The cap was applied and the irrigation started, usually without any preparation of the wound whatever. The sequence of events was fairly constant:

(*a*) Within twenty-four hours, in every case, there was a noticeable reduction of induration, tenderness and swelling. The wound cavity was found to contain irrigating fluid with an admixture of pus cells.

(*b*) On the following day the swelling had disappeared almost entirely. The surrounding tissues, which before were brawny, were now soft and pliable, and tenderness was absent or greatly reduced. The immediate neighborhood of the wound had lost its dusky appearance. The granulations appeared red and succulent. The wound cavity contained clear irrigating fluid with an admixture of lymph, and it was no longer possible to express pus from any of its side tracks. The waste pail contained large quantities of pus. There might or might not be a sharp rise in temperature. A noteworthy phenomenon at this time was an enormous increase in the bacterial count, which had jumped from three or five per field to 100 or 200 per field.

(*c*) After the expiration of another twenty-four hours the swelling and induration had definitely vanished. It needs to be seen to be appreciated, this softening and dwindling of a "stove-pipe" appearing limb, almost to its normal size and texture. The wound at this time bore but slight resemblance to the wound on which treatment had been begun three days before. The bacterial count was still high. There was still a good deal of pus in the waste pail, often more than on the previous day. The temperature, if any, had dropped to normal, and the patient himself felt better than he had felt for weeks.

(*d*) Somewhere between the third and sixth day there was a sharp drop in the bacteriologic curve, down to one or two or none in ten fields. The excretion of pus also was reduced, the fluid in the waste pail being practically clear. Yet this fluid showed, when treated with nitric acid, a large proportion of albumin. The volume of albumin was much

greater than may be accounted for by the osmotic power of the hypertonic sodium chlorid solution; indeed, it is not appreciably lessened in amount if physiologic sodium chlorid solution is used, showing that the exudation of lymph is due, largely, to the incidence of negative pressure.

(*e*) On removal of the appliance about the sixth or seventh day, the surface of the wound was clean and the surrounding tissues were everywhere pliable. After the application of gauze packs for several hours, clear, straw-colored lymph was found staining the dressings and oozing from the mouth of the wound. Frequently the wound was filled with blood. The bacterial count was usually nil in ten fields. The wound, from then on, made rapid strides toward repair.

The foregoing is a fair account of what happens with wounds of the most inveterate type. Of the events recorded, two in particular are deserving of the closest scrutiny. One of these is the greatly augmented discharge of pus cells during the initial stages of the irrigation. Better drainage of the wound does not satisfactorily explain this increment, since the wound proper is capable of holding only a few drams of pus, and this small quantity is washed away during the first few hours of the irrigation. Moreover, the quantity discharged is out of all proportion to the amount, either that the wound can hold, or that its lining granulations would normally excrete within the time. It is believed that the increment is due, both to the increased exudation of leukocytes from the tissue spaces and to their accelerated transmigration from the capillary vessels, in response to the hyperemia produced by negative pressure.

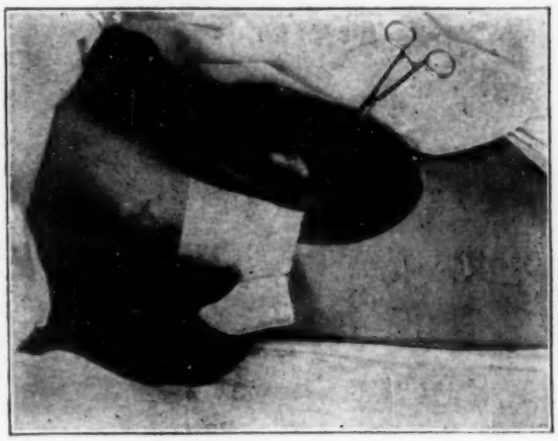

Fig. 5.—Appliance being bandaged to a wounded thigh.

Analogous to this forced excretion of pus, and even more significant, is the abrupt rise and subsequent drop to zero of the bacteriologic curve. Is the rise due only to increased excretion, or is it evidence of stimulated microbial growth? The concomitant amelioration of the clinical signs, and the reduction of swelling, proceeding hand in hand with the copious discharge of inflammatory products, point unmistakably to the conclusion that it is a "catharsis" which occurs, of lymph, pus cells and bacteria, from infected tissues. This view is supported also by the fact that the elevation of the bacterial count was always higher, and the increment of pus cells always greater, in old-standing cases with widespread induration and swelling. Recent wounds frequently showed little or no increase.

The thoroughness with which the neighboring tissues of a wound are "washed" is indicated by the aseptic manner in which Thiersch's skin grafts "take" on a foul granulating surface which first has been cleansed, for two or three days, by tidal irrigation, in which the negative phase has been emphasized to the point of securing a definite reaction. If a portion of such an area is thus treated, and the remaining portion is treated in the customary way, any antiseptic whatsoever being used, and if Thiersch's grafts are then applied to each portion, a marked difference will be observed in the behavior of these two sets of grafts. This test is commended to any one in doubt as to the relative merits of the two procedures.

CONCLUSION

To what extent may we attribute to a plan of treating wounds the clinical results which follow its employment? Experiments verified by "controls" are unequivocally conclusive; yet, for reasons that are obvious, it is rarely possible to apply this method of verification to the treatment of wounds. "Post hoc propter hoc" is notoriously fallacious, since most wounds tend naturally to heal. Nevertheless, if the previous history of a wound infection has been long and tedious, the clinical manifestations of disease overt and palpable, and the condition most intractable; then, if the subsequent history is inaugurated *abruptly*, the clinical signs ameliorate rapidly and the wound, thereafter, makes for repair, and if this right-about-face transformation coincides invariably, in point of time, with the institution of a certain treatment, surely it may be said that the state of the wound prior to the treatment serves well enough for a control to the effect which follows it. In the judgment of those of our surgical staff who had occasion to watch these cases from day to day, the results herein described were extraordinary, and were considered as the outcome of the tidal movement imparted to the irrigating fluid.

Rather would it have seemed strange had the power to control the pressure of the irrigating fluid *not* modified, to some extent, the course of wound infections, considering what a physiologic factor this one of pressure is. In respect to any therapeutic measure capable, as this is, of altering profoundly the physical conditions under which the tissues live, it would not have lacked significance had 400 wounds been treated, with uniformly good results. The tissues were activated to a degree which might have given (and as a fact did give) rise to apprehension. It seemed as though such interference must have some effect, and there were reasons to foresee that the outcome would be gratifying; for though the procedure in question is radical in the sense that its component elements had not been employed in combination before, it is the reverse of radical in that each item of its rationale is the expression of a surgical maxim. Thorough evacuation, drainage, scrupulous cleansing of the wound cavity and its lining granulations, hyperemia, lymphorrhea, warmth, etc., are all old friends whose familiar features need not seem the less familiar for being associated together.

It is not possible, in the scope of the present paper, to give minute instructions for the management of every contingency to be encountered in the different types of cases, nor is it altogether necessary. Wounds may be irrigated in this tidal manner with less of troublesome detail than any other method of wound treatment demands. This is true of any wound situated on an accessible surface of the body which may be conveniently covered by the appliance. Yet, owing to inattention to the laws of physics, or to the surgeon's undue apprehension in the use of an unfamiliar method, and sometimes through the indifference of

a nurse or the whim of a nervous patient, we have seen the treatment hurriedly discontinued, the surgeon nothing doubting that he had given it a trial. Were tidal irrigation as difficult as, actually, it is easy to accomplish, it would still repay the effort made to understand it, and the use of one's constructive faculty ter now stands, the basic fact is established, of a simple to improve it and to simplify its technic. As the mat- and convenient means of containing fluid in a wound. An appreciation of what this fact implies, and the exercise of no more thought and enterprise than most surgical maneuvers impose on the surgeon, will be rewarded by results such as cannot be obtained in any other way.

SUMMARY

1. The irrigating cap herein described is designed to make liquid-tight contact with the skin, circumferentially about a wound, without the aid of any adhesive substance whatever. The mechanical expedient employed, to this end, is used here for the first time in surgery.

2. The cap permits fluid to be contained in a wound without leakage, even under considerable pressure, and without constriction of the part or obstruction to its blood supply.

3. From this a system of wound treatment has resulted whose rationale conforms to the established principles of surgery.

4. This treatment comprises the repeated filling and emptying of the wound and the alternate use of positive and negative pressure, the duration of each of these phases of pressure being sufficiently prolonged to insure its maximum effect on the tissues.

5. The ebb and flow movement of the fluid is shown to have a marked cleansing action as regards the wound secretions, the effect of negative pressure being to induce hyperemia and lymphorrhea, to increase phagocytosis, and to cause a forced output of bacteria from the wound.

Fig. 6.—Apparatus applied, the inflow tube connected with an irrigating can held by a stand beside the bed, and the outflow tube joined to a length of rubber tubing leading to a waste pail below. The appliance is completely covered by the bandage. The patient is able to conduct the irrigation himself. By opening the pinch cock on the inflow tube and closing the one on the outflow, the wound is filled. By reversing the procedure the fluid is siphoned off and negative pressure maintained by the weight of the column of fluid which hangs in the outflow tube.

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Ill Health and Ignorance.—Much of the ill health in the homes of people is due to ignorance. From that ignorance often emerge the beginnings of disease. It is at such times that the first fatal step is taken, and a symptom regarded as trivial, too trivial, indeed, to require medical aid, is dealt with by a much advertised "cure all" patent medicine obtained from a chemist. Deceived by a blatant advertisement, which preys on ignorance, the home treatment is pursued until it is proved worthless during which valuable time is lost, followed by the development of more manifest disease symptoms.—*Medical Press and Circular* **109**:66 (Jan. 28) 1920.

CHRONIC LEUKORRHEA: ITS PATHOLOGY AND TREATMENT*

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CHICAGO

Efforts to advance our knowledge of chronic leukorrhea have thus far yielded only moderate success. The underlying pathology is not thoroughly understood, and treatment has been distinctly unsatisfactory. For these reasons I have made a prolonged study of the subject in an endeavor to learn more about the problems involved.

ETIOLOGY OF CHRONIC LEUKORRHEA

The gonococcus is the primary cause of most chronic purulent discharges of women who have not borne children. This organism cannot often be isolated from chronic cases, but none the less it causes the original discharge, decreases the resistance of the tissues, and thus prepares the soil for mildly virulent bacteria which thereafter stubbornly resist our efforts to dislodge them.

In women who have borne children, resistance is decreased through lacerations, relaxation of supports, continued passive congestion and erosions. Here again, bacteria of low virulence find a foothold and produce chronic discharges which are cured with the utmost difficulty.

An especially important type of chronic leukorrhea, and one which is very difficulty to cure, is that associated with pelvic cellulitis. Whether the cellulitis persists because of a focus lodged deep in the cervical glands, or the cervix becomes reinfected from the cellular tissues, remains in my mind a somewhat open question. In any event, the discharge tends to recur even after apparent recovery.

Less important and less frequent cases, neither the result of gonococcal infection nor consequent to pregnancy, are "nonspecific" venereal infections and persistent mild infections due to abnormally low resistance.

Bacteria.—The bacterial flora of chronic cases is fairly uniform.[1] Anaerobes, especially gram-negative bacilli, are most numerous. At least four types of gram-negative diplococci are encountered. Most

* From the pathologic laboratory and gynecologic service of St. Luke's Hospital.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-First Annual Session of the American Medical Association, New Orleans, April, 1920.

1. Döderlein: Das Scheidensekret und seine Bedeutung für das Puerperalfieber, Leipzig, 1892. Menge and Krönig: Bakteriologie des weiblichen Genitalkanales, Leipzig, 1897. Curtis, A. H.: On the Etiology and Bacteriology of Leukorrhea, Surg., Gynec. & Obst., March, 1914, p. 299.

important of all are gram-positive diplococci; these may be anaerobic or aerobic, and are almost always found in those cases which are subject to recurrent symptoms of acute inflammation.

PATHOLOGY OF CHRONIC LEUKORRHEA

Pathology of the Cervix.—Some years ago, I became convinced that hypertrophic infected cervical glands are a most important factor in chronic leukorrhea. Study of curetted material from the present series of cases confirms this view. Distinct evidence of chronic cervical infection was obtained from twenty-one out of twenty-two patients with chronic leukorrhea (Fig. 1). Gland hypertrophy was the rule; small areas of scar formation were frequent; in addition to plasma cells and other round cells, the microscope usually revealed abundant polymorphonuclear leukocytes.

Only within the last fifteen months has the frequency of two other cervical lesions been recognized: endocervical granulations and strictures. Their significance is perhaps comparable with granulations and strictures of the male urethra.

Granulations are felt to grate on the dilator as it is passed into the cervix. They may be found anywhere along the canal.

Strictures are most often encountered midway between the external and internal os or at a higher level. Some dilate with ease; others are firmly resistant. Differentiation of strictures from normal arbor vitae occasionally causes difficulty.

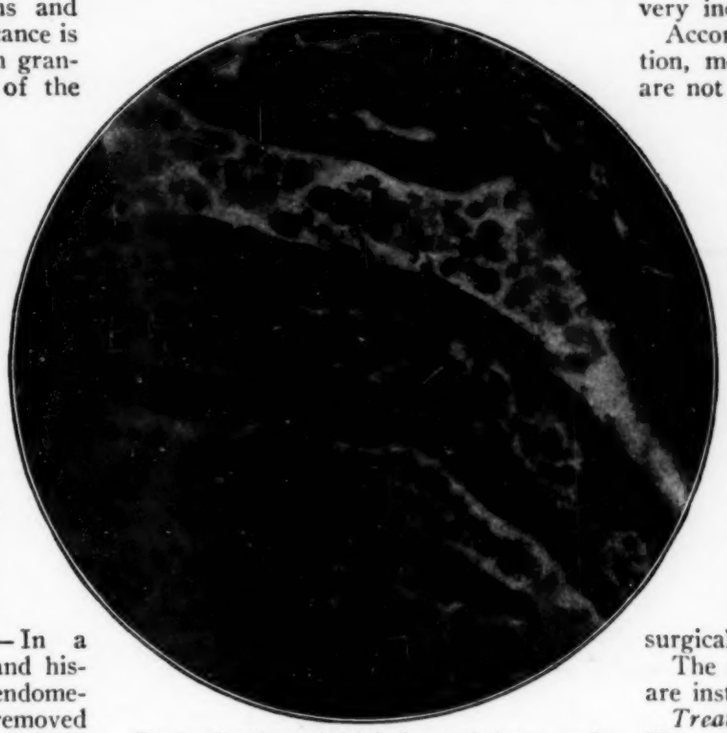


Fig. 1.—Chronic cervical infection; typical severe endocervicitis in a case with leukorrhea of two years' standing; × 450.

The Relation of the Endometrium to Chronic Leukorrhea.—In a previous bacteriologic and histologic study[2] of the endometrium from 118 uteri removed to remedy various pathologic conditions, I found that chronic infection of the uterus above the level of the cervix is infrequent. Patients whose endometria yielded bacteria almost all had salpingitis with equally good growth. It was concluded that chronic endometritis, independent of infection of adjacent pelvic tissues, almost never occurs as a clinical entity.

The present study of chronic leukorrhea indicates that endometritis may occasionally accompany chronic cervicitis (Fig. 2). For the purpose of comparative histologic study, scrapings were obtained from the fundus at the time of diagnostic curettage of the cervix. As previously mentioned, chronic cervicitis, often of considerable severity, was present in all except one of twenty-two curetted patients. Six revealed evidence of chronic endometritis, but in no instance was the inflammation severe.

It is scarcely necessary to mention that the vaginal portion of the cervix also contributes to leukorrhea when glandular erosions develop on it. Occasionally erosions become implanted throughout the vagina, in which case the vaginal walls produce a discharge.

Skene's ducts, the urethra, and Bartholin's ducts and glands are often considerable factors in the persistence of leukorrhea. This is notably true of infection of Skene's ducts.

TREATMENT

Only chronic leukorrhea is under consideration. Most acute discharges tend to improve spontaneously. Remedies too numerous to discuss have been extensively used. These include curettage, treatment of the uterine cavity, applications to the lower cervix, vaginal douches, administration of glycerin or other hygroscopic solutions, vaginal tampons, various kinds of powders, and vaccines. We have tried them all, with very indifferent results.

According to my interpretation, most popular procedures are not sufficiently directed toward the pathology of leukorrhea. Deep cauterization of the cervix, as employed by Hunner,[3] is theoretically of value, and is said to be helpful in selected cases.

In the series herewith reported, the patients have been subjected to a thorough pelvic examination, the reaction of the discharge tested, smears obtained from the cervix and vagina, and a set of cultures made.

Gross pathologic lesions are corrected surgically.

The usual hygienic measures are instituted.

Treatment of the Cervix.—The most usual and most difficult focus to eradicate lies in the endocervix. Unless the discharge is essentially of vulvovaginal origin, radium is advocated in all severe cases of persistent chronic leukorrhea. After thorough dilatation, the cervix and fundus may be curetted for diagnostic purposes.

Fifty mg. of radium, preferably two 25 mg. tubes in tandem, are introduced high into the cervix, held by a suture passed through the external os, and left for several hours. One or more subsequent radium treatments of shorter duration may be required. It is thought best to plan on an interval of from ten to twelve weeks' duration between applications.

Each radium tube employed in the treatment of this series of cases has been screened by a double gold capsule with a total thickness of 2 mm. The capsule in turn has been incased in dental rubber. At present the screen has been reduced to a single rubber covered

2. Curtis, A. H.: A Combined Bacteriological and Histological Study of the Endometrium in Health and in Disease, Surg., Gynec. & Obst. **26**: 178 (Feb.) 1918.

3. Hunner, G. L.: The Treatment of Leukorrhea with the Actual Cautery, J. A. M. A. **46**: 191 (Jan. 20) 1906.

gold capsule of 1 mm. The duration of application has been correspondingly decreased.

Examination of cervical tissues after successful radium treatment (Fig. 3) reveals atrophy of the glands, a relative increase in fibrous tissue, and the disappearance of any microscopic evidences of infection.

Skene's ducts harbor the next most important focus. At the time of radium application, or under procain anesthesia, the blunt end of a needle, held in forceps, is threaded into the duct lumen, and its end is forced through the base of the duct so that the needle head protrudes into the vagina. The duct is split with a knife and the tract fulgurated.

Bartholin duct infection may be eradicated by similar treatment. Infected Bartholin glands rarely require excision.

The urethra is occasionally treated by dilatation, aided by instillations of weak silver nitrate solution.

STUDY OF MATERIAL

In 1914, there was reported an intensive bacteriologic study of eighty-five cases of chronic leukorrhea. At the same time the results of various kinds of treatment were carefully observed. Before the present study was begun, many additional patients had been treated. The therapeutic results obtained in that entire series were distinctly disappointing.

Treatment of the forty-six patients now under consideration has been essentially that described above. All were afflicted with long-standing persistent discharge, in most instances sufficient to necessitate the constant use of napkins to prevent soiling of linen. A summarized study of these cases is presented in the accompanying table.

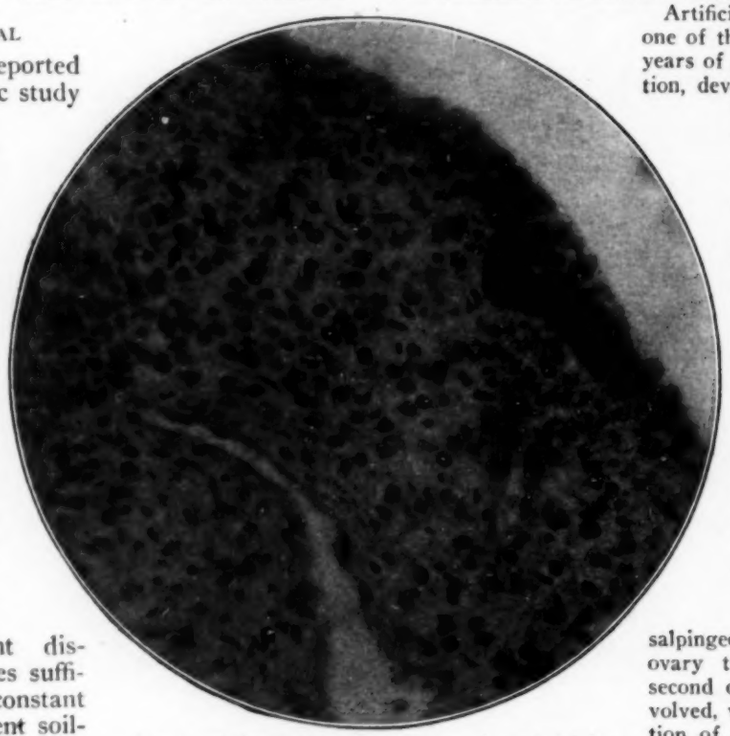


Fig. 2.—Endometritis, a complication of cervical infection; plasma cells abundant; numerous polymorphonuclear neutrophils present; × 300.

GROUP 1.—*Recovered* (twenty-five cases).—Seventeen of these patients had free discharge; in eight it was excessive. All have now returned to a normal condition.

A history of gonorrheal etiology or definite evidence of previous gonorrhea was present in fifteen. In three the leukorrhea followed pregnancy. Radium treatment for uterine hemorrhage had produced stricture and profuse leukorrhea in one instance. A highly irritating chronic discharge was due, in one patient, to repeated douches with cold tap water.

Of five patients with leukorrhea of uncertain etiology, two had been uncomfortable for years because of profuse, creamy discharge. One of these suffered from chronic pelvic cellulitis and femoral thrombophlebitis; the other had cellulitis without evident tubal involvement.

Fifteen of this group of patients had cervical erosions, two of which were slight; seven of moderate size, and six large. Two were excised; all the others disappeared under treatment.

Cervical granulations or strictures were encountered nine times. Obstruction from strictures was of high grade in six cases.

Radium treatment was given to twenty of this group; twelve received one treatment; six, two treatments; one, three treatments, and one, four treatments. I wish particularly to mention one patient whom we had treated for ten years without relief. Fulguration of Skene's ducts and one short radium treatment resulted in an absolute cure within six weeks.

Artificial menopause occurred in one of this group. This patient, 39 years of age, with scanty menstruation, developed amenorrhea after a treatment of 500 millicuries.

GROUP 2. — *Improved* (seven cases).—One patient with excessive foul discharge developed leukorrhea during pregnancy. Abortion followed, with persistence of discharge thereafter; this continued throughout a succeeding pregnancy, which terminated at seven months. Repair of a cystocele, removal of an everted eroded anterior cervical lip, and two short treatments with radium have resulted in almost complete recovery.

A patient 33 years of age had been subjected to salpingectomy and removal of one ovary two years previously; the second ovary, although slightly involved, was not removed. Destruction of infected Skene's ducts and dilatation of a granular, strictured cervix, with one application of radium has decreased a profuse purulent discharge almost to normal. An undesired menopause was ushered in. This patient presumably had very little normal ovarian tissue at the time radium was given.

Another patient with badly infected Skene's ducts, whose scrapings revealed severe endocervicitis and normal endometrium, had received no benefit at our hands from two years' treatment of various kinds. Five months ago Skene's ducts

STUDY OF FORTY-SIX PATIENTS TREATED FOR CHRONIC LEUKORRHEA

		Etiology			Gross Pathology				Treatment						
											Curettage, Cervix and Fundus (for Diagnosis)	Radium Applications			
Group	Number of Cases	Gonorrhea	Result of Pregnancy	Other or Unknown Causes	Cervix Erosion	Endocervical Granulations or Strictures	Chronic Pelvic Cellulitis	Infection of Skene's Ducts	Destruction of Skene's Ducts	Dilatation of Cervix		1	2	3	4
												No. of Patients			
1. Recovered.....	25	15	3	7	15	9	2	11	12	24	9	12	6	1	1
2. Improved.....	7	6	1	0	5	3	0	6	5	4	5	2	3	2	0
3. Treatment interrupted (2) or recently begun (8)	10	7	0	3	6	8	0	9	9	8	6	9	1	0	0
4. Not improved...	4	3	1	0	1	2	3	3	3	2	2	1	1	1	0

were destroyed, and the cervix was dilated and treated with radium. Extreme malaise disappeared; leukorrhea has dwindled to a slight amount.

The fourth and fifth cases, with chronic cervicitis and infected Skene's ducts, showed marked improvement after duct destruction and one radium treatment. Both have very recently received a second treatment, the results of which are not yet evident.

Finally, the very slow response to treatment, encountered in two patients, deserves brief comment.

A woman, aged 23, with offensive, foul, extremely profuse leukorrhea of three years' duration, was found to have all the usual foci of infection, including cervical granulations and complete cervical obstruction. An enormous erosion, bathed in pus, covered nearly the entire vaginal portion of the cervix. Eight months ago Skene's ducts were destroyed, the stenosed cervix dilated, and 600 millicuries of radium administered; there was no improvement. Two months later, a second radium application was made; again there was no notable improvement. Menstruation remained uninfluenced. Three and one-half months ago, after explanation that more radium might suppress menstruation, she received a third treatment. There was no evident improvement for many weeks, but the erosion has now entirely healed, and the malodorous, fetid discharge has given way to a much less abundant creamy leukorrhea; although still profuse, it is not offensive. Menstruation was excessive and prolonged after the last radiation, but has now returned to normal. It is planned to give a final treatment within a few weeks, after a rest of four months since the last application.

The other patient with slow response to treatment had a profuse leukorrhea of two years' duration. It was only after a third administration of radium that the discharge was influenced. At present, recovery is almost complete, but moderate increase in the menstrual flow warns that we have reached this patient's present tolerance for radium. If more is given, it will be a short exposure after many months' delay and with full understanding that temporary amenorrhea may result.

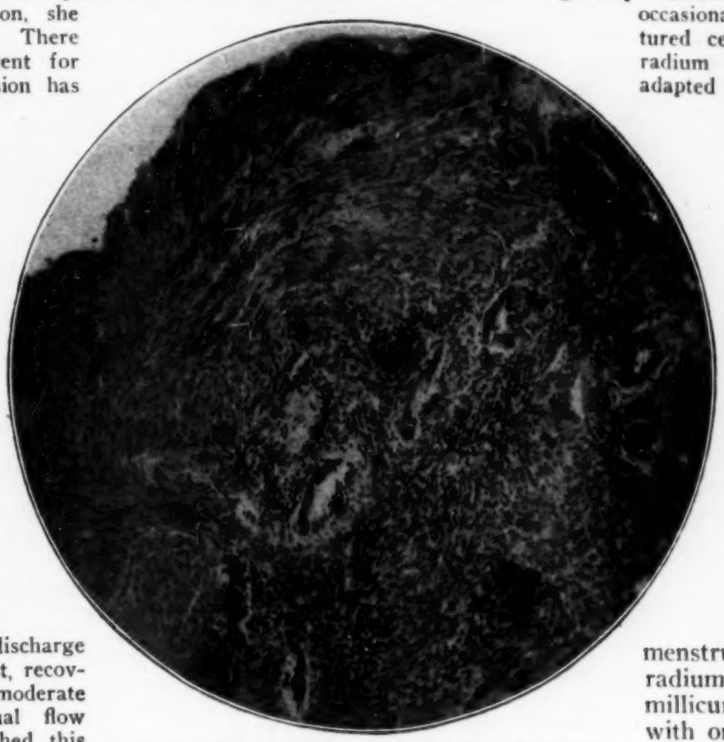


Fig. 3.—Healed cervix, six months after radium treatment for chronic leukorrhea; great decrease in number of glands; those that persist are atrophic; × 120.

GROUP 3.—*Treatment Interrupted or Recently Begun* (ten cases).—Two patients disappeared after a single treatment and have not been heard from. Eight cases are too recent to permit deductions concerning the efficacy of treatment. These cases are included in the present series chiefly because material obtained from them has been used in that portion of this report which is concerned with the pathology of chronic leukorrhea.

GROUP 4.—*Not Improved* (four cases).—A patient with moderate leukorrhea had suffered for many years with left-sided pelvic cellulitis, which was the result of infection after abortion. Infection of Skene's ducts, both Bartholin ducts, and one Bartholin gland, was also present. There was a slight erosion of the cervix, but no strictures or granulations. Scrapings revealed considerable inflammation, which was equally pronounced in the endocervix and in the endometrium. The infected ducts were destroyed, and the cervix was treated with radium. There has been no improvement in the condition; this is ascribed to inaccessible deep-seated pelvic infection.[4]

A patient with irregularly recurrent pain in the right pelvis (cellulitis), since infection at childbirth fourteen years previously, suffered greatly from vulvitis caused by a moderate, thin, milky discharge. At operation elsewhere a catarrhal appendix and normal tubes and ovaries had been found. Two radium treatments have totally failed to give relief.

The third patient in whom treatment has been unsatisfactory had, in addition to the discharge, an otherwise symptomless relaxation of uterine supports with moderate displacement backward and to the right. She has received three radium applications at intervals of several months. Nervousness, flushes and slightly irregular, increased menstruation followed the last treatment. Slow improvement is manifest, but recovery is improbable unless radium is employed in an amount sufficient to destroy ovarian function.

In the last of this group there was low-grade infection, which apparently invaded all of the pelvic organs and cellular tissues. A mild arthritis involved many joints and caused much distress. Slight improvement has been obtained through occasional dilatation of the strictured cervix. It is thought that radium treatment is not well adapted to this type of case, and will be dispensed with if possible.

COMMENT

Of thirty-six patients available for thorough treatment, thirty received radium and twenty were subjected to destruction of Skene's ducts. Twenty-five recovered, seven were distinctly improved, the result in one was doubtful, and three were not materially benefited.

Menopause was produced in two patients. One of these, 39 years of age, with scanty menstruation at the time of radium treatment, received 500 millicuries. The other patient, with one remaining partly diseased ovary, received 700 millicuries.

Sufficient radium distinctly to influence ovarian activity was given to three patients, each of whom received three treatments at infrequent intervals. Symptoms of impending amenorrhea in these three patients were characterized by greatly increased irregular menstruation, with associated nervousness and tendency to occasional flushes. All returned to symptomatically normal condition within three months.

In explanation, it should be stated that these patients were aware of the possibility of artificial menopause before their last radium treatment, but decided to incur the necessary risk.

Granted that radium is a remedy of value, certain questions arise. How many patients, in the course of radium treatment directed to the relief of chronic leukorrhea, will require radiation in an amount suffi-

4. A recent message from this patient states that the discharge has entirely ceased. This report has not been confirmed by local examination.

cient to produce amenorrhea? Again, in those cases amenable to cure through moderate doses of radium, are the functions of childbearing or formation of internal secretion materially disturbed, even though menstruation continues?

Experience thus far indicates that the pathologic changes in most cases are within reach of radium. The present plan is to discontinue the use of a double gold screen, replacing it with a single rubber covered gold capsule, not over 1 mm. in thickness. Short applications, made at intervals of not less than ten weeks, permit observation of the effects of each treatment. Even in repeatedly treated stubborn cases it is thus possible to avoid production of premature menopause. Whether it will often be necessary to discontinue treatment before cure is effected remains to be determined.

It is my opinion that radium in amounts small enough not to disturb menstruation is not to be feared as a cause of sterility. On the other hand, it will probably not be especially beneficial in the relief of sterility because a large percentage of patients with cervix infection have already suffered from catarrhal salpingitis. Two exceptions have been encountered: A patient of Dr. Watkins, who had not been pregnant for five years, complained of sterility. Conception developed within three months after relief of a cervical catarrh through an application of 500 millicuries of radium. The other patient received 925 millicuries. She is now pregnant and expects to be confined in two months.

Finally, a word on the relationship of chronic leukorrhea to focal infections. Chronic arthritis has been noted with unexpected frequency in patients without other demonstrable foci; the regions most involved are the lower spine, sacro-iliac joints, and the finger joints. It is too early to determine the amount of improvement obtainable through cure of the vaginal discharge; this evidence will be awaited with interest.

CONCLUSIONS

1. Important foci of infection are to be found in Skene's ducts and the uterine cervix. The chief cervical lesions consist in hyperplasia of infected cervical glands, endocervical granulations and strictures, and erosions of the cervix.

2. Discharges arising from Skene's ducts are relieved by free incision and fulguration of the infected tracts.

3. Chronic leukorrhea of cervical origin is, in most instances, amenable to cure through dilatation of strictures and treatment with small doses of radium applied at infrequent intervals. The prognosis is less favorable in those cases with chronic cellulitis or uncorrected gross pelvic lesions.

104 South Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. FRANCIS REDER, St. Louis: The genital tract of woman in a normal condition is usually bathed in a leukorrheal discharge. There has been a tendency to disregard the true meaning of the word leukorrhea, the term being applied to almost any discharge escaping from the female genital fissure. When could a leukorrhea be considered chronic or pathologic? Usually when the woman consults the physician. It is to be regretted that women frequently disregard a vaginal discharge for a long time before seeking advice. This often has its bad consequences, inasmuch as a discharge where bacterial invasion has been of short duration is more readily relieved than a discharge of long standing, where infectious micro-organisms have been allowed full freedom to accomplish their contamination, thus increasing the difficulties of a cure. Furthermore, the anatomic peculiarity of the structures forming the canal of the cervix and the cavity of the uterus favor the persistency of the discharge. There is no submucosa. The mucosa is intimately connected with the underlying muscularis, the extremities of the glands dipping more or less freely into that structure. These occluded and buried glands harbor the micro-organisms. The gonococcus is responsible for a chronic leukorrhea in the majority of cases. A good history will greatly assist in arriving at the true nature of the discharge. It is well to bear in mind that in the adult a gonococcus infection invades the vulva, especially the urethra and vulvovaginal glands, and the cervix uteri. Rarely does the vagina suffer. An infection of the cervix uteri is often primary. In instituting treatment for a chronic vaginal discharge, it should be ascertained if it is a vulvar, a vaginal, a cervical, or an intra-uterine leukorrhea. Often a discharge having its origen in a chronically inflamed cervix, one which has become indurated by alveolar hyperplasia, will be readily cured by a plastic operation. As far as radium is concerned: I have not used it. The present status of the use of radium in chronic leukorrhea, as I see it, is this: Will a woman in the menstrual age consent to have her chronic leukorrhea cured at the risk of sacrificing her menstrual function?

DR. THOMAS J. WATKINS, Chicago: Dr. Curtis' work follows up the work of Hitchman and Adler which demonstrated that the amount of endometrium obtained on curettage depends on the menstrual cycle and has very little relation to the question of infection. The bacteriologic work done, especially by Dr. Curtis, three or four years ago, showed that in the great majority of cases the cavity of the uterus is sterile; that the bacterial invasion is limited to the cervix. This means that currettage is an operation which has been done much too often, that there is almost no indication for curettage of the endometrium, except for diagnostic purposes. The reason why curettage has helped in some cases of uterine leukorrhea is that the cervix was dilated. Dilatation of the cervix is valuable to improve drainage. The question of the care of infections in the vaginal orifice is a very important one, one very frequently neglected. As to the action of radium in these cases, I wish to emphasize the fact that erosion of the cervix will almost invariably heal over after the use of radium. It is important to regulate the dose so as not permanently to injure the function of the ovary. Radium diminishes the number of epithelial cells and increases the number of connective tissue cells and in this way drains the deep glands in the cervix.

DR. PETER B. SALATICH, New Orleans: If the uterus is displaced backward, you can plicate and cut as much as you like and the patient will continue to have leukorrhea because the congestion is permanent and continuous. A young woman came to me with her face full of acne. She had headache and joint troubles. I examined her cervix and found it entirely devoid of mucous membrane. I used phenol and curetted. The patient was not relieved. Then I used a solution yielding active chlorin, and in five or ten applications the patient was well.

DR. ARTHUR H. CURTIS, Chicago: Except in a few instances, when granulations were very excessive, a preliminary curettage was done only for diagnostic purposes. It is not advisable to apply radium when there is marked infection of the upper genital organs. One of the men from the Pasteur Institute who visited with us in Chicago some months ago, stated that he had used radium in 250 cases of pus tubes and that the results were very encouraging. To say that the use of radium is out of proportion to the seriousness of leukorrhea or the infections which cause leukorrhea, indicate that the speaker is a man, not a woman. If he had to walk around with a profuse purulent discharge and was forced to wear a napkin all of the time, he would be glad to have radium used. I do not believe in giving enough radium to sterilize the patient or interfere with the menstrual function. In most of the cases of this series I used a thick double gold

screen. Recently I have screened much less and now I usually employ a gold capsule half a millimeter in thickness, surrounded by a thin covering of dental rubber. I have tried innumerable remedies for the cure of leukorrhea, but have found none of them efficacious.

RESULTS OF THE EXPOSURE OF ANIMAL OVARIES TO THE RAYS OF RADIUM *

JOHN M. MAURY, M.D.
MEMPHIS, TENN.

The experiments here recorded were made for the purpose of determining the changes brought about in the ovaries of rabbits by exposing them to 50 mg. of the element radium for twelve hours. This dosage was selected because it is that generally used in cases of so-called idiopathic uterine bleedings but which are now regarded as being due to an abnormal condition of ovarian secretion.

As some of these cases, particularly in young subjects, can be cured by the internal administration of pituitary extract, it is possible that not all of them are due entirely to ovarian conditions, some being due rather to a disturbance of the balance normally existing between the output of the pituitary gland and the ovaries.

It is well known that the intra-uterine application of radium has an effect on menstruation proportionate to the dose, 50 mg. of the element applied for twelve hours being sufficient to stop menstruation for several months, and in some instances to establish the menopause permanently. The generally accepted theory is that this result is brought about by a destructive action of radium on the follicles most advanced in development, menstruation returning after the young follicles, on which radium is supposed to have had no effect, have had time to mature. Little account, so far as I can learn, seems to have been taken of the effect which must be produced on the endometrium, on which its greatest power must be exerted.

Considering the small amount of radium used in these cases and the distance from the uterine cavity to the ovaries, to one who is accustomed to the use of radium there must be some doubt arising as to the results being brought about in the manner claimed. It is also difficult to imagine a satisfactory reason why the mature follicles should be killed and the less mature ones remain uninfluenced, especially as everywhere else in biology the less mature a thing is the greater its susceptibility to disintegrating influences. As a matter of fact, I have not been able to substantiate this theory by microscopic examination of the ovaries treated, and I have other evidence which seems to show that neither the large nor the smaller follicles are influenced by this dosage of radium.

In determining changes which may have resulted from treatment, great difficulty is encountered because the normal ovary presents no fixed standard for comparison. In normal ovaries, degeneration is present to a greater or less degree in follicles in all stages of development, comparatively few completing the cycle of growth to maturity and rupture with the discharge of a living ovum. This is particularly true in the rabbit, because ovulation does not take place without copulation. Follicles maturing except at this time do not continue to live, but die and degenerate and, as pointed out by Graves, all those follicles arriving at maturity during pregnancy must become atretic. It was therefore necessary to examine a large number of normal ovaries to familiarize oneself with the great variations that may exist.

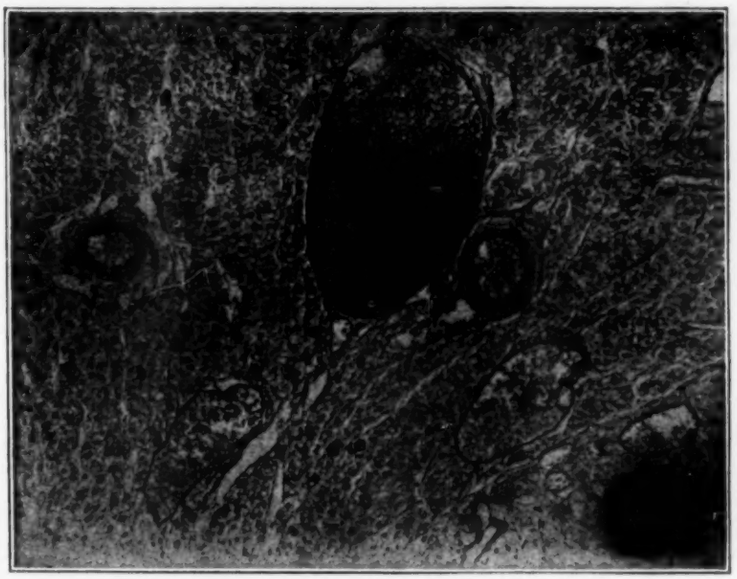


Fig. 1.—Blood vessels nine weeks after 600 mg. hours of radium. No endarteritis; peculiar thin walled vessels filled with blood.

Ovaries of rabbits differ from the human ovaries in the amount of epithelial tissue present. While the human ovary may be described as a connective tissue organ containing graafian follicles and having a fibrous capsule outside of which is the germinal epithelium, the rabbit ovary is a mass of epithelial cells having a thin connective tissue cortex surrounded by the capsule and germinal epithelium. Most of the follicles are found embedded in the connective tissue cortex. The epithelium of the body of the ovary can easily be distinguished from the epithelium of the corpus luteum by the latter cells being of larger size and surrounded by the theca.

The ovaries of rabbits occupy a rather fixed position in either flank, close to the abdominal wall and just above the crest of the ilium. In this position they are much closer to radium placed on the skin surface than are the ovaries of the human being to radium placed in the uterine cavity. Having less tissue intervening, they are therefore more susceptible to the action of the rays.

Fifteen female rabbits were treated, each being given a dosage of 600 milligram hours, the radium applied to the skin surface overlying the ovaries. One was killed in three weeks, two in four weeks, two in five weeks, four in six weeks, three in eight weeks and four in nine weeks. The ovaries removed were not touched with fingers or forceps. They were placed in 70 per cent. alcohol at once and run up for paraffin sections as soon as possible. The first few were sectioned serially and examined throughout. This con-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-First Annual Session of the American Medical Association, New Orleans, April, 1920.

sumed much more time than was available, and was found to be unnecessary. Therefore in the others, from fifty to seventy-five sections were removed from each side and from the middle portion of the ovary and examined, making about 150 to 200 sections from each ovary. In the examinations of sections, special attention was given to the germinal epithelium, the connective tissue cortex, the blood vessels and the follicles.

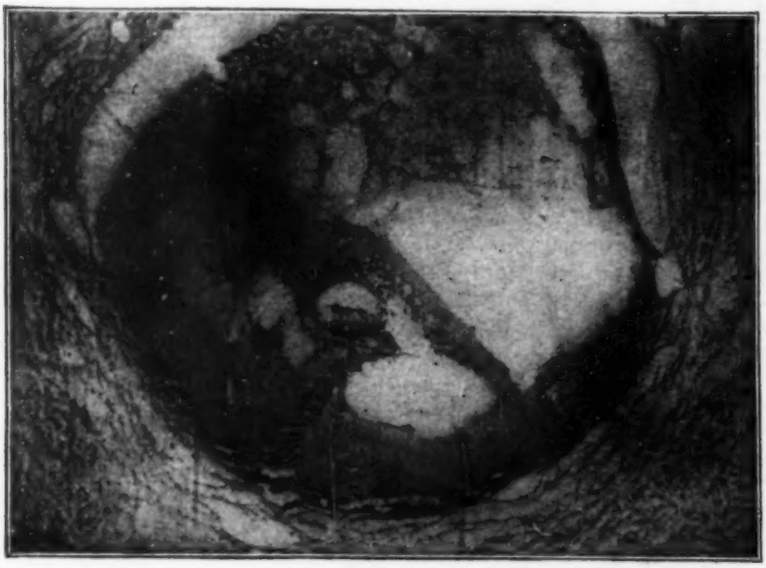


Fig. 2.—An atretic follicle, to illustrate the difference between degenerating follicles and nondegenerating ones.

Macroscopically, the ovaries varied greatly in size. One, a sclerotic ovary, was a mere strip of tissue composed, as seen under the microscope, of only connective tissue with almost no follicles. I do not think this was the result of the treatment because the ovary was removed only three weeks after treatment, and there were no signs of follicles in a state of degeneration and almost no small follicles of any size, a change so great that it could hardly have taken place in three weeks. The variation in size seemed to depend on the number and size of the atretic follicles and corpora lutea present. Both in number and size these structures varied greatly in different ovaries. In all ovaries examined, the germinal epithelium was present and in normal condition. The connective tissue cortex varied much in thickness in different ovaries, even the two ovaries from the same animal presenting considerable variation. The blood vessels showed no signs of endarteritis, and as they normally have unusually thick walls, this change could easily have been observed had it been present.

As would naturally be expected, the greatest variation was shown in the condition of the follicles. In seven of the ovaries examined there were no follicles approaching maturity either alive or in a state of degeneration. In twelve there were living follicles at or close to maturity which showed no evidence of having been affected by the treatment. In the remaining eleven all the large follicles were in a state of degeneration. Deducting, therefore, the seven ovaries not containing follicles of sufficient size to be supposedly affected by radium, there remain twenty-three, twelve of which contained large follicles showing no effect from treatment.

In addition to this evidence, two rabbits were put with a male and became impregnated five weeks after treatment, in one four and in the other five embryos being removed from the uterus several weeks later—rather convincing evidence of the viability of the ovum when it was discharged from the ovary.

Two other animals which had become pregnant were later treated and did not miscarry, indicating that the membrana granulosa of the mature follicles, from which the corpus luteum cells are probably formed, was not degenerated; for it is well known that if the corpus luteum of pregnancy is destroyed in its early stages, the fetus will be cast off.

From these results I think it a fair deduction that a 600 mg. hour dosage of radium does not produce degeneration of the follicles of the ovaries.

REPORT OF EXPERIMENTS

RABBIT 1.—Killed in three weeks after 600 mg. hours of radium.

Right Ovary: Quite small. Not more than half the thickness of the left ovary.

1. The germinal epithelium is normal.
2. This ovary resembles the human ovary in that the connective tissue exists throughout and there is no epithelium except in a few corpora lutea. A cirrhotic ovary.
3. Very few primordial follicles and only a few small follicles; some alive, some dead and degenerating. No medium sized follicles and no large ones. None in a state of cystic degeneration.
4. Blood vessels normal, but few in number.

Left Ovary: Double the size of right one.

1. Germinal epithelium normal.
2. Connective tissue cortex surrounding epithelial mass.

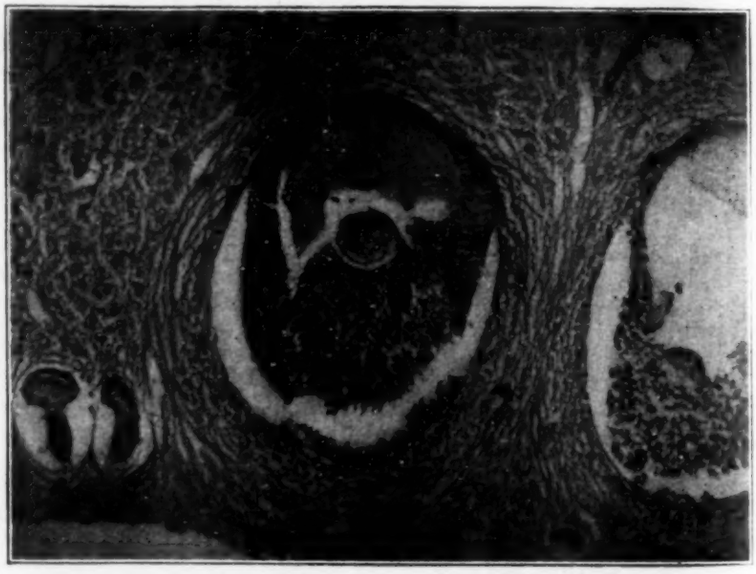


Fig. 3.—A nearly mature nondegenerating follicle eight weeks after 600 mg. hours of radium; shrinkage of granulosa from theca is postmortem.

3. Two primordial follicles which seem to be normal. Fairly large number of small follicles, some degenerating and some in normal state of preservation. A considerable number of large atretic follicles. All large ones atretic.

4. Blood vessels normal.

RABBIT 2.—Killed four weeks after 600 mg. hours of radium.

Fig. 4.—A nearly mature nondegenerating follicle nine weeks after 600 mg. hours of radium; also shows smaller follicle in state of preservation.

Righ Ovary: 1. Germinal epithelium heaped up over one portion of the ovary, opposite which, in the cortex, are a very large number of primordial follicles. This heaping up of the germinal epithelium is irregular in outline and not even, as when cut on a slant.

2. The connective is greatly in excess of the epithelial body of the ovary, extending in places deep down into it.

3. Primordial follicles are in large numbers. A considerable number of small follicles beyond the primordial stage. A number of large follicles just under maturity not in a state of degeneration. A few atretic follicles.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Moderate number of primordial follicles. Very few small follicles. No follicles of any size not in a state of cystic degeneration.

4. Blood vessels normal.

RABBIT 3.—Killed four weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal

2. Connective tissue normal.

3. Primordial small and medium size follicles normal. One large nearly mature follicle undegenerated. A few large atretic follicles.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue normal.

3. Many primordial and small follicles. No follicles of size supposedly to be affected by radium.

4. Blood vessels normal.

RABBIT 4.—Killed five weeks after 600 mg. hours of radium.

Righ Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Primordial follicles relatively few. A fair number of small follicles, some of which are degenerating. No large follicles and no atretic follicles.

4. Blood vessels normal.

Left Ovary: Shows the same condition as the right ovary. Neither shows follicles of a size to be supposedly influenced by radium.

RABBIT 5.—Killed six weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex rather thin.

3. Primordial follicles relatively few, and many of them in a state of degeneration. Some small follicles, but none of medium or large size. No atretic follicles. The ovary is of fair size, but contains only a small amount of follicular tissue.

4. Blood vessels normal.

Left Ovary: 1. Heaping up of germinal epithelium in places. Normal elsewhere.

2. Connective tissue thin in places, but quite thick in others where numbers of primordial follicles are embedded.

3. Primordial follicles are found in numbers in places. Scarce in other places. Small and medium size follicles few. A few large cystic follicles. One large nearly mature undegenerated follicle.

4. Blood vessels normal.

RABBIT 6.—Killed six weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex thin.

3. Few primordial follicles. A large number of small follicles not degenerated. A number of nearly mature undegenerated follicles. A few atretic follicles.

4. Blood vessels normal.

Left Ovary: Quite small in size.

1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Few primordial follicles. Some small follicles not degenerated. Some large degenerated follicles, and several almost mature not degenerated.

4. Blood vessels normal.

RABBIT 7.—Killed six weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. A few primordial follicles. A number of small follicles,

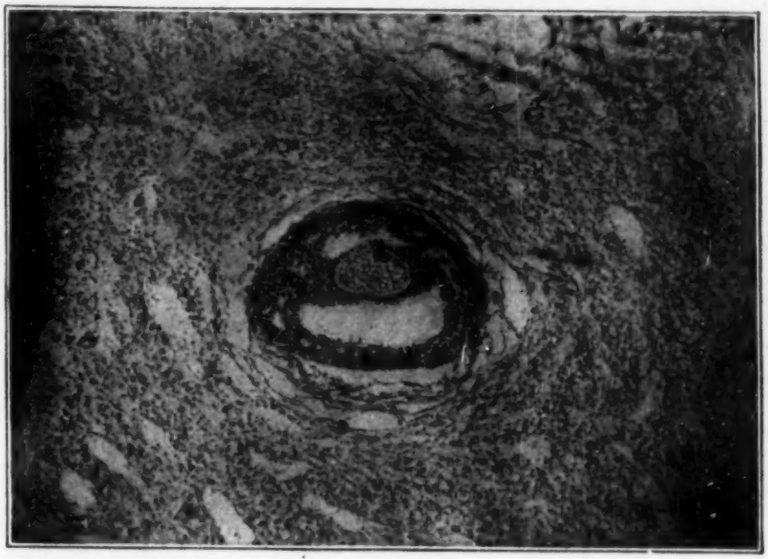


Fig. 5.—A nearly mature nondegenerating follicle six weeks after 600 mg. hours of radium.

some degenerated, others not. No follicles near maturity not degenerated. Several large atretic follicles.

4. Blood vessels normal.

Left Ovary: A number of primordial and small follicles in normal state. No follicles nearing maturity not in state of degeneration. Other structures, i. e., germinal epithelium, connective tissue cortex and blood vessels, in normal state.

RABBIT 8.—Killed six weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue normal.

3. Many primordial small and medium size follicles present and in normal condition. Several nearly mature follicles in normal state of preservation. A few atretic follicles.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue normal.

3. Primordial small and medium size follicles normal. Several nearly mature follicles in normal state of preservation. A few atretic follicles.

RABBIT 9.—Killed eight weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex thin in some places, thick in others. About normal in amount.

3. Primordial follicles few and not affected. Small follicles fairly numerous; some degenerating, others normal. No follicles near full development not degenerated. A few large follicles in state of cystic degeneration.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Primordial small, medium and nearly mature follicles normal. A number of atretic follicles present.

4. Blood vessels normal.

RABBIT 10.—Killed eight weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. A large number of primordial and small follicles in normal state. A number of atretic follicles.

4. Blood vessels normal.

Left Ovary: Fairly large, but smaller than the right.

1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Many primordial and small follicles in normal state.

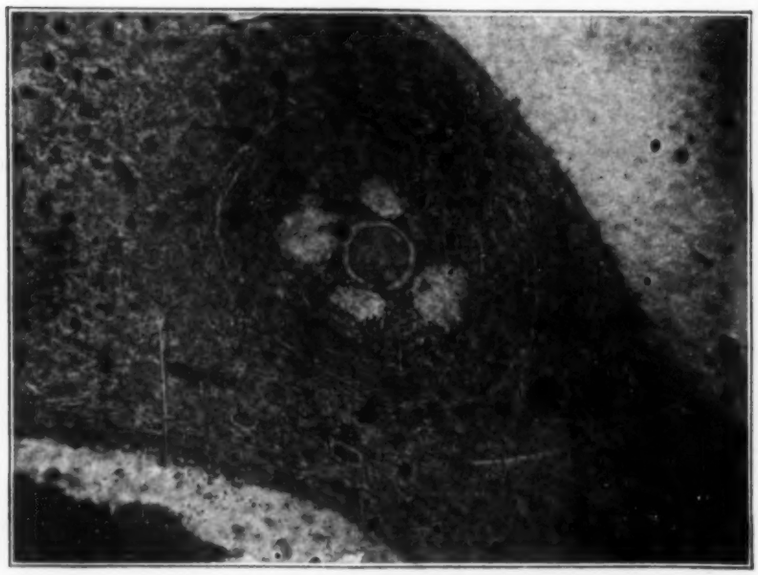


Fig. 6.—A nearly mature nondegenerating follicle eight weeks after 500 mg. hours of radium; it shows an unusually developed theca.

Many follicles near maturity in normal state of preservation. Many atretic follicles.

4. Blood vessels normal.

RABBIT 11.—Killed eight weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. All follicles except the primordial and small follicles in a state of degeneration. A number of atretic follicles.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Very few follicles of any size. No large follicles present.

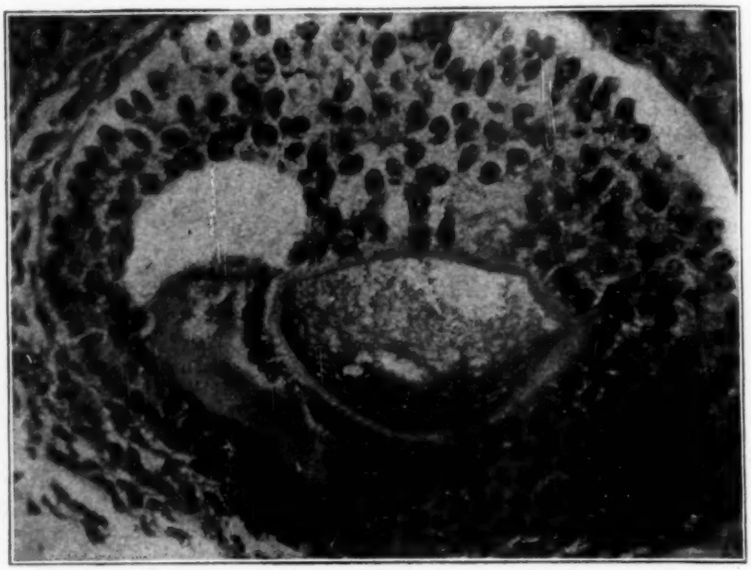


Fig. 7.—High power of nondegenerating follicle nine weeks after 600 mg. hours of radium.

4. Blood vessels normal.

RABBIT 12.—Killed nine weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Primordial follicles few in number. Medium size follicles few. The nearly mature follicles all in a state of degeneration. The degeneration is more marked in the granulosa than in the ovum.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium, connective tissue and follicles are as described in right ovary. There are a number of thin walled vessels filled with blood, a condition not seen in other ovaries examined.

RABBIT 13.—Killed nine weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Few primordial and moderate number of medium size follicles. Large follicles all in state of degeneration.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex thin.

3. Few follicles of any size to be seen. One nearly mature follicle in state of preservation.

4. Blood vessels normal.

RABBIT 14.—Killed nine weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex rather thin.

3. Very few primordial or small follicles present. A few nearly mature follicles in state of degeneration. Several large atretic follicles.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Few primordial, many small follicles. A few medium size and a number of nearly mature follicles in normal state. A number of large atretic follicles.

4. Blood vessels normal.

RABBIT 15.—Killed nine weeks after 600 mg. hours of radium.

Right Ovary: 1. Germinal epithelium normal.

2. Connective tissue cortex normal.

3. Many primordial and small follicles. No follicles of size to be affected by radium.

4. Blood vessels normal.

Left Ovary: 1. Germinal epithelium normal.

2. Connective tissue normal.

3. Many primordial and small follicles, some normal, some degenerated. All follicles near maturity degenerating.

4. Blood vessels normal.

720 Bank of Commerce Building.

ABSTRACT OF DISCUSSION

DR. HENRY SCHMITZ, Chicago: There is much difference of opinion as to how radium causes amenorrhea in the treatment of uterine hemorrhage, either idiopathic or myomatous. Most writers regard it as a destruction or degeneration of the ovarian epithelial cells. I believe that the effect of the radium is almost exclusively confined to the endometrium which receives in a twelve hour exposure of 50 mg. of radium element a burn of the third degree in some parts, a burn of the second degree in the parts more distant from the radium capsule and a burn of the first degree in the most distant lateral portions. A burn of the third degree causes an irreparable damage, while burns of the first and second degrees heal very readily with partial restitution of function in the endometrium. The action of the rays on the ovaries is negligible. I have examined microscopically many ovaries obtained by panhysterectomy in cases of carcinomatous uterus to which from 6,000 to 8,000, and more, milligram element hours of gamma rays had been applied. Macroscopically, a decrease in the size of the ovaries was noted; on section the ovary appeared to be hard and sclerotic and devoid of follicles. Microscopically, a degeneration or absence of all epithelial cell structures was noted. The interstitial tissue or stroma was not affected. The sensibility of the ovaries to the rays in comparison to the erythema skin dose, which is taken as the standard in biologic measurements, is about five times greater. The ovaries are on an average about 8 cm. distant from the middle of the upper portion of the uterine cavity, the usual location of the radium capsule in these treatments. Supposing that the radium carrier is exactly maintained in this position, then according to the law of the inverse ratio the ovary receives one sixty-fourth the amount of rays the endometrium receives at 1 cm. distance. At 1 cm. distance from a radium capsule the lethal erythema skin dose is about 100 milligram element hours and at 8 cm. it is 64 × 100 or 6,400 milligram element hours. If this is divided by five, the ovarian sensibility quotient, then the amount of milligram element hours to cause degeneration of the ovarian epithelial cell elements, so that amenorrhea results, must be at least 1,280 milligram element hours. Hence, 600 milligram element hours, the amount usually used, cannot produce degeneration in the human ovary. Dr. Maury's findings and conclusions may also be proven by clinical observations. Many of these patients, after a period of amenorrhea lasting usually from three to six months, again menstruate regularly. Evidently, the damage in the endometrium was partly repaired and ovulation, not having been interfered with, begins to exert its influence on the repaired endometrium. Two patients, one treated for an essential menorrhagia, the other for a myomatous menorrhagia, soon after treatment conceived and had normal pregnancies and labors. The infants, also, were perfectly normal. These two instances prove beyond doubt that radiation did not affect the ovaries, or if it did, the injuries were not irreparable. The results of these animal experimentations would be beyond criticism if the erythema skin dose of the rabbit had been determined and the distance between the radium capsule and the ovary had been noted. If one of the ovaries had been removed in each rabbit first, and the one left behind treated immediately afterward, comparisons could have been made between the irradiated and the normal ovary in the same animal.

Fig. 9.—A follicle nine weeks after 600 mg. hours of radium. There is beginning degeneration in the granulosa, with a well preserved ovum. This degeneration is probably not the result of radium, as nine weeks have elapsed since treatment, and the changes are only beginning.

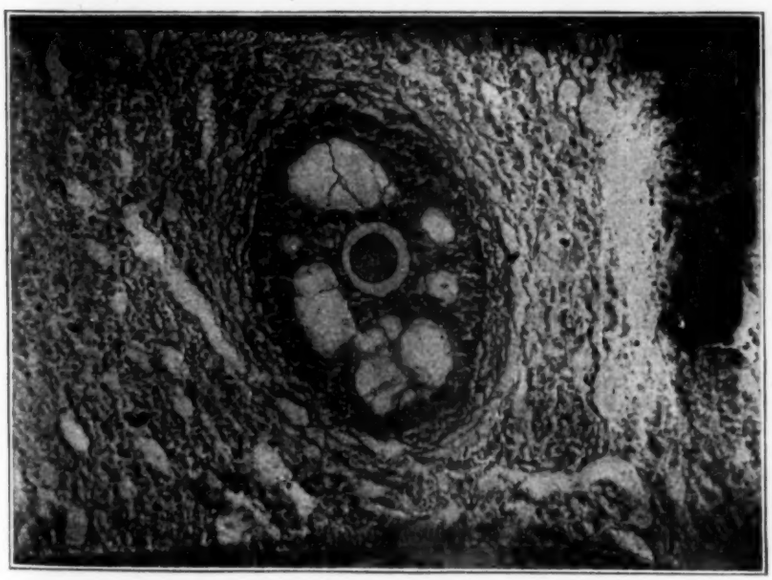


Fig. 8.—A well preserved follicle six weeks after 600 mg. hours of radium.

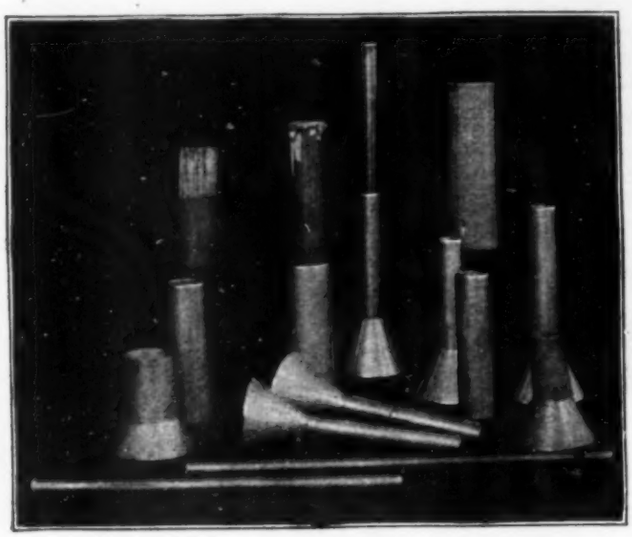
The Ideal of Preventive Medicine.—Preventive medicine can never be satisfied until it has attained Isaiah's ideal (Isaiah lxv, 20): "There shall be no more thence an infant of days, nor an old man that hath not filled his days; for the child shall die an hundred years old."—Arthur Newsholme, *Commonhealth*, Nov.-Dec., 1919.

Clinical Notes, Suggestions, and New Instruments

APPARATUS FOR COLLECTING CARBON DIOXID SNOW

WILLIAM ALLEN PUSEY, M.D., CHICAGO

I am repeatedly called on for advice as to the best apparatus for collecting and molding carbon dioxid snow, or for information how to collect and mold it. These requests are still so frequent that it seems to me worth while briefly to describe the method which I have found satisfactory and



Apparatus for collecting carbon dioxid snow.

which requires only such apparatus as one can readily devise for himself. This method is as follows:

I use a piece of chamois skin to collect the snow. Two or three layers of towel or cloth can be used, but chamois is better. A piece of chamois skin about the size of a large handkerchief is a convenient size. The tank of liquid carbon dioxid is kept on a rack where it is slightly inclined with the nozzle at the lower end, so that the liquid carbon dioxid will be blown out when the vent is opened. To collect snow, the chamois is wrapped around the tip of the tank so that it bags over the vent but forms a fairly tight sack around the tip. If then the shut-off is opened by a turn of the wrench, carbon dioxid will escape into the chamois, and, if there is any liquid in the tank, will quickly collect as a mass of snow in the chamois. A very few seconds is sufficient to collect enough snow to make the ordinary stick. The vent is closed after a few seconds; the chamois unwound, and the snow can then be scraped up in a spoon to be put into the molds.

For molds I use metal or rubber tubing such as is shown in the accompanying illustration. A good length for the molds is about 3 inches. I keep a supply of molds varying in diameter from one-third inch to 1½ inches. For the smaller molds, which have to stand a severe strain from the pounding necessary to make hard sticks, seamless metal tubing is best; otherwise the tubing is likely to give way at the seam. For making large, thick sticks a rubber mold is sufficient, but it is not so good as a metal one. For convenience, on each mold that is frequently used I have attached a permanent funnel.

With the larger molds I push down the snow through a funnel like the two short molds, one of which stands at either side in front in the illustration. For molding the snow in the cylinders I have metal or wooden rods which correspond approximately in diameter to the diameters of the tubes in which they are used. The only other apparatus necessary is a hammer with which to drive down the snow with the rods.

The snow collects in the chamois in a loose mass. It is pressed down into the molds with the rods by hand as firmly as possible. This procedure is repeated with successive quantities of snow until the cylinder is well filled with a firm mass. Then it is hammered down with a hammer until a firm stick of snow is formed. In a tube of small diameter, one can hammer it down firmly enough to make a stick of ice; but ordinarily it is not desirable to have the stick so hard. In a minute or two after forming the stick, it becomes loose in the mold through evaporation, so that it can easily be pressed out of the mold. It is then handled between the fingers protected by a bit of chamois skin. After the sticks are made they can easily be shaped to any form desired by melting on a metal surface. For this purpose I keep a little nickle-plated flat-iron with the handle taken off. On this, carbon dioxid snow can be readily made in any desired shape.

The only difficulty about this method of molding the sticks is that one must have some solid base on which to pound. I have always done this on a corner of the top of a fire-proof safe. The advantage about this method of molding carbon dioxid snow is that it gives one a wide range in the size of the sticks that he can make. One does not always want the same size sticks. This method is convenient and it has entirely served my purpose.

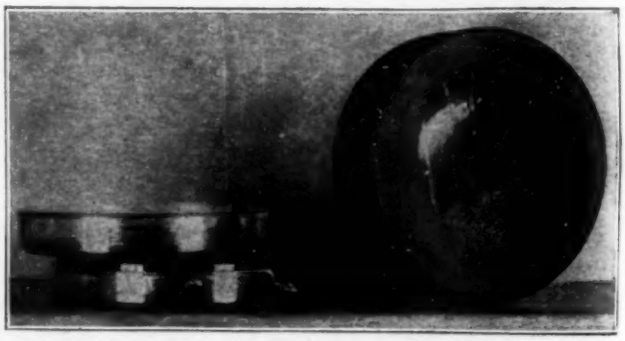
7 West Madison Street.

A SIMPLIFIED PLATE METHOD OF PARTIAL OXYGEN TENSION IN THE CULTIVATION OF THE GONOCOCCUS *

RUSSELL D. HERROLD, M.D., CHICAGO

The idea of growing the gonococcus and other organisms under reduced tension is not new. Wherry and Oliver[1] have demonstrated the value of the method. Chapin[2] and more recently Maitra[3] have used it with success in obtaining primary cultures on a variety of mediums.

The advantage of using plates in the isolation of the gonococcus is obvious when it concerns the isolation of gonococci mixed with other bacteria. Here, streaking of the material over a large surface is necessary to obtain discrete colonies. The simple method of using partial oxygen tension plates here described has been devised and employed with success in this laboratory.



Two inoculated plates, one with gonorrheal material, the other with Bacillus subtilis: at left, with open sides facing each other; at right, with edges enclosed by rubber band.

Two inoculated plates, one with the gonorrheal material, and the other with *B. subtilis*, are placed together with the open sides facing each other as shown at the left in the illustration. Then a closed rubber band 2½ inches wide by 3½ inches in diameter encircles both, enclosing the edges but allowing aerial communication between them, as shown at

* From the John McCormick Institute for Infectious Diseases.
* This work was carried out by means of a grant from the United States Interdepartmental Social Hygiene Board.

1. Wherry, W. B., and Oliver, W. W.: J. Infect. Dis. **19**: 28 (Sept.) 1916.
2. Chapin, C. W.: J. Infect. Dis. **23**: 342 (Oct.) 1918.
3. Maitra, G. C.: Indian J. M. Res. **7**: 219 (July) 1919.

the right. Satisfactory bands may be obtained by cutting wide rubber tubing into pieces of the required width. The simplicity of this method makes it practical for the small laboratory and, in addition, permits of individual cultures being examined without disturbing others, as is necessary with several cultures in a single jar. The rubber also serves equally well for air exclusion plates, which have a distinct advantage over open aerobic plates in gonococcus cultivation; but they are inferior to the partial oxygen tension method just described, especially in obtaining primary growth. Parallel plates have been tested with a variety of mediums, and the best growth was obtained on nutrient bactoveal agar in which dibasic sodium phosphates were substituted for sodium chlorid.[4] Ascites fluid and defibrinated goat blood were added in the approximate proportion of 2 c.c. of ascites fluid and 0.5 c.c. of blood to each Petri dish before pouring the plates. A fair growth has resulted with this medium minus ascites fluid.

Cultures of gonococci have been obtained in several cases of chronic infections in which the gonococcus could not be identified in smears. In all the acute cases of gonorrheal urethritis there was a profuse growth, parallel aerobic plates showing fewer and smaller colonies.

Recently this scheme has been used in place of the culture of *B. subtilis* with good results: A quantity of sodium bicarbonate is placed in the Petri dish instead of the culture of *B. subtilis*, and at the same time a small glass tube containing 0.5 c.c. of 1 per cent. sulphuric acid is introduced so that when the plates are enclosed in the rubber band the two chemicals come into contact with each other. In this way sufficient carbon dioxid is liberated to produce a favorable tension.

ACETANILID ADDICTION: REPORT OF A CASE

WALTER H. NADLER, M.D., CHICAGO

This case is of clinical interest because of difficulty in diagnosis, aggravated by persistent denial of drug addiction and by malingery on the part of the patient.

REPORT OF CASE

History.—Miss X, graduate nurse, aged 26, was admitted to Wesley Memorial Hospital, Oct. 20, 1919, complaining of attacks of pain in the left hypochondrium, and of chills and fever. The pain was sharp, was transmitted to the back, and had recurred at intervals of about three weeks over a period of two years.

The course of her illness may be divided into two periods. The first period, from 1909 to 1915, consisted apparently of recurrent nose, throat and accessory sinus infections, and of anemia. During this time, tonsillectomy, turbinectomy, frontal sinus and left mastoid operations and drainage of an appendical abscess were performed. From 1915 to 1917 seems to have been an interval of fair health. The second period, from January, 1917, to the present time, is characterized by an entirely new group of symptoms. While the patient was still in bed, following an operation for the relief of apparent intestinal obstruction, cyanosis appeared, together with dyspnea on exertion. During convalescence from a second operation in the left mastoid region, she was seized with sudden, severe pain in the left upper abdomen, followed by fever. The urine was scant and dark colored. Cyanosis had been continuously present, though of variable intensity, since that time, and attacks of pain had recurred at rather regular intervals. For the relief of these symptoms, she submitted to an exploratory laparotomy and a kidney operation. Hospital records indicate that nothing abnormal was found and that no relief was afforded. In view of her occupation and the use of narcotics after her formidable series of operations, the patient was particularly interrogated in regard to the use of drugs. Any such habit was earnestly denied.

Examination.—The patient was intensely anemic and cyanotic, well nourished, apparently febrile and in great pain. The temperature was 103, the pulse and respirations normal. The sclerotics and the oral mucous membranes were definitely icteric. Scars of the operations described were present. Marked tenderness and slight involuntary muscle defense in the left hypochondrium were noted. The liver and spleen were not palpable. Atrophic rhinitis with an accumulation of scabs was reported as a possible atrium of infection. Roentgen examination of the chest and gastrointestinal tract detected nothing abnormal save a limited excursion of the diaphragm, not due to adhesions, on the left side.

The urine, which was reddish brown, contained urobilin and much unidentified sediment, but appeared otherwise normal. The blood serum, also reddish brown, contained neither hemoglobin, bile salts nor pigment (Gmelin test); the Wassermann test was negative. Hemoglobin, in spite of the obviously anemic appearance, was estimated as from 95 to 100 per cent., probably because of the dark color of the serum. The red blood count was 3,180,000, and the white count, 11,800. Blood smears showed slight poikilocytosis and the general appearance of secondary anemia.

Clinical Course.—After the first week in the hospital, during which the afternoon temperature was recorded as from 103 to 104, it became apparent that the fever was simulated, the desired reading being produced through the aid of a hot water bag. At the same time, it was suggested by Dr. E. L. Ross that the clinical picture resembled that of acetanilid poisoning. Examination of the urine revealed the presence of acetanilid. Methemoglobin was not definitely detected in the blood serum.

Cyanosis gradually disappeared, but after five or six days reappeared. Use of the drug was again denied, but, confronted with her written order to a neighboring druggist, the patient surrendered acetylsalicylic acid and acetanilid tablets and admitted that she had taken six of the latter. Confession was finally made of the use of acetanilid, to 50 grains a day, over a period of nearly three years. Use of the drug antedated the appearance of pain in the left side; it was begun for the relief of headache and pain following her early operations. During the remaining weeks in the hospital, cyanosis and icterus disappeared; the urine and blood serum became of normal color, and no attacks of pain occurred. November 17, the patient was discharged from the hospital apparently well, except for persistent slight tenderness in the left hypochondrium.

The following day she applied for admission to the Cook County Hospital, complaining chiefly of pain, weakness and dyspnea. After a period of observation, anemia due to long continued hemolysis caused by numerous infections was suspected. Cyanosis was noted, November 23. Attacks of pain recurred at regular intervals; opiates were administered. Finally, malingery of fever and of certain other symptoms was detected. March 18, the patient was discharged, feeling well enough to go to work. All of the symptoms were explained on a neurotic basis except the cyanosis and slight icterus, which were considered probably due to acetanilid or a similar hemolytic drug.

COMMENT

The symptoms are those of the definite complex characteristic of chronic poisoning due to acetanilid, which is recognized as a habit-forming drug.

30 North Michigan Avenue.

4. Martin, W. B.: J. Path. & Bacteriol. **15**: 76, 1911.

Health Education.—During the year the necessity for health education among teachers has become more evident and courses on the care of mothers and children for use in colleges and normal schools are being prepared under the Federal Board of Vocational Education. Undoubtedly the revelation of our recent draft rejections, showing that at least one half the defects were such as might have been eliminated in childhood, has added impetus to the interest in the physical condition of our children; and the supplementary evidence of malnutrition and defects, as brought out by the weighing and measuring test, has helped focus public opinion on physical fitness.—*Am. J. Pub. Health* **9**: 350, 1919.

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SATURDAY, JUNE 19, 1920

HEMOGLOBIN AND CARBON DIOXID

The oxygen-carrying power of hemoglobin has been so widely studied and seems to be so well understood that little attention has been given to this pigment in relation to the movement of other gases in the body. Up to comparatively recent times, the transport of carbon dioxid in the organism has been attributed to the inorganic salts of the plasma, notably the bicarbonate. The rôle of other potential carriers, such as the proteins, has been emphasized more or less, while Buckmaster and Bayliss have even attributed the entire transport of carbon dioxid to hemoglobin directly. The problem of how the bound carbon dioxid could be released from the bicarbonate or protein combination in the lung has been a stumbling block in the theories, although the older workers recognized in the acid properties of hemoglobin a possibility of causing the unloading of carbon dioxid in the lung. As a matter of fact, hemoglobin, with its iso-electric point at p_H 6.7, is always acting as an acid under the conditions of hydrogen ion concentration in the blood. Some such acid liberating agent must be present in the lung, for the mere decrease of carbon dioxid tension from that of the tissues to that of the alveolar air would not cause the gas to pass off from the carbon dioxid-bicarbonate system of the plasma.

Parsons [1] has shown that the concentration of base in the blood is sufficient to account for all of the carbon dioxid to be carried as bicarbonate. In addition, he demonstrated that another weak acid must be present in the lung to aid in the unloading of the carbon dioxid by competing for the base of the bicarbonate. This acid, *a priori,* must be one whose salt with the base is decomposed by such concentrations of carbon dioxid as occur in the tissues. Parsons states that the proteins act as such an acid in the blood, and that the chief among these is hemoglobin.

L. J. Henderson,[2] elaborating somewhat on Parsons' work, has shown that in hemoglobin in the blood we have the unusual case of an acid which, under stress of circumstance, alters its degree of dissociation. Obviously, the circumstance is the presence of oxygen. In the lung, hemoglobin which, as stated above, acts as an acid in the blood, combines with oxygen, and immediately its ionization is increased and its power to bind base is accordingly increased. This base is at hand in the bicarbonate, and on combining with the oxyhemoglobin it leaves the carbon dioxid free to be blown off. In the tissues the oxygen leaves the base-oxyhemoglobin combination, and the hemoglobin, returning to its feebler degree of ionization, loses the base, which is then free to help carry the carbon dioxid back to the lung as bicarbonate. Henderson also states that the other proteins as well as the phosphates take part in transferring base from the lung to the tissue.

Parsons [3] adds that the variation of hydrogen ion concentration under the influence of carbon dioxid, as it occurs in the blood, requires the presence of a slightly ionized acid, such as hemoglobin. In addition to its other functions, hemoglobin thus functions as a buffer. It appears, therefore, that from the latest theoretical considerations of well-known data the hemoglobin of the blood not only acts as a carrier of oxygen throughout the organism, but also plays an important part in the transport and release of carbon dioxid in the body.

1. Parsons, T. R.: The Reaction and Carbon Dioxide Carrying Power of Blood—A Mathematical Treatment, J. Physiol. **53**: 42 (Sept.) 1919.

2. Henderson, L. J.: The Equilibrium Between Carbon Dioxide and Oxygen in the Blood, J. Biol. Chem. **41**: 401 (March) 1920.

3. Parsons, T. R.: The Reaction and Carbon Dioxide Carrying Power of the Blood—A Mathematical Treatment, J. Physiol. **53**: 340 (Feb.) 1920.

ORANGE JUICE CONSIDERED IN A NEW LIGHT

It is recognized by pediatricians that artificially fed infants thrive better if they receive some addition to cow's milk, particularly when the latter is pasteurized or sterilized. One reason for this, now understood, is that many of the artificial food mixtures are likely to be qualitatively incapable of averting scurvy in young children, so that some added antiscorbutic must be provided. For this purpose orange juice has attained a well deserved popularity. Other fruit juices have likewise been used with success as antiscorbutics; and latterly the juices from certain vegetables have been demonstrated to have a similarly beneficial influence in the dietary of the young. Owing to the price and occasional scarcity of oranges, notably during the war, special efforts were made, both here and abroad, to secure suitable substitute antiscorbutics for infant feeding. The use of the tomato, first urged by A. F. Hess of New York, has been particularly promising owing to the fact that, in contrast with some other antiscorbutics, this readily available vegetable can be dried or canned without losing its potency in antiscorbutic vitamin, and it can be administered efficiently in various ways, including intravenous injection of the juice.

From the recent investigations of Osborne and Mendel it appears that the tomato has even further properties to commend its use during the period of growth; for it is rich in the water-soluble antineuritic vitamin,[1] and likewise in the fat-soluble vitamin [2] (fat-soluble A) characteristic of milk fat and egg fat. Such observations, along with numerous others of recent date indicating how widespread is the fat-soluble vitamin in vegetable products,[3] show that this important food factor need not be sought solely in foods known to be rich in fats. As Osborne and Mendel have remarked, the newer studies indicating the richness of many types of plant tissues in those nutritive properties termed vitamins place the dietary importance of the green vegetables in an entirely new light. It emphasizes their use to supplement the refined foods of the modern food industry which furnish products rich in proteins, fats and carbohydrates but in many cases comparatively deficient in the vitamins. The tomato is striking in exhibiting all the now recognized vitamin potencies; the antineuritic, antiscorbutic and the fat-soluble vitamin. Little wonder, then, that it has found an important place in the dietary.

Orange juice has also now been shown to be possessed of something more than attractive flavor and antiscorbutic virtues. The same observers [4] have demonstrated the presence of the water-soluble B, the antineuritic vitamin, in both the juice and the inner peel of the orange—a finding promptly corroborated by Byfield and Daniels [5] at the University of Iowa. Evidently, therefore, when orange juice or tomato is added to the food of an infant, something more than an antiscorbutic is furnished. The Iowa pediatricians have noted that in every case when the antiscorbutic dose of orange juice, 15 c.c., was increased to 45 c.c. a day to infants whose weight had remained stationary for a number of days, there was a marked stimulation of growth. A mere increase of food intake (calories) of itself had no such influence on the rate of gain.

Orange juice from which the antineuritic vitamin (water-soluble B) is removed by adsorption [6] does not thus stimulate growth, although it still has antiscorbutic properties. This answers the assertion that the antiscorbutic vitamin may be responsible for promotion of growth. In feeding orange juice, provided the quantity is not too small, one is administering at least two highly beneficial adjuvants to the diet. This fact, and the growing practice of early enlarging the diet of milk fed infants by the use of fruit juices, etc., is significant further in view of the recent demonstration by Osborne and Mendel [7] that cow's milk, from a comparative standpoint, is not rich in water-soluble vitamin. Osborne and Mendel have pointed out how recent studies of the antiscorbutic value of cow's milk [8] have indicated that on this score it must be classed as less valuable than many of the raw fruits and vegetables. Whereas quantities of the latter—less than 10 gm. daily—will prevent scurvy in guinea-pigs on a diet otherwise devoid of antiscorbutic material, from 100 to 150 c.c. daily of raw cow's milk are required for this species, according to Barnes and Hume, while monkeys require larger quantities. Similarly, relatively large quantities of milk are required to produce the increased intake of food and improved rate of growth which are readily secured by very small quantities of many green vegetables.

1. Osborne, T. B., and Mendel, L. B.: The Vitamines in Green Foods, J. Biol. Chem. **37**: 187 (Jan.) 1919; Nutritive Factors in Plant Tissues, III, Further Observation on the Distribution of Water-Soluble Vitamine, ibid. **41**: 451 (March) 1920.

2. Osborne, T. B., and Mendel, L. B.: Nutritive Factors in Plant Tissues, IV, Fat-Soluble Vitamine, J. Biol. Chem. **41**: 549 (April) 1920.

3. Osborne and Mendel (Footnote 2). Steenbock, H., and Gross, E. G.: Fat Soluble Vitamine, IV, The Fat-Soluble Vitamine Content of Green Plant Tissues Together with Some Observations on Their Water-Soluble Vitamine Content, J. Biol. Chem. **41**: 149 (Feb.) 1920. Steenbock, H., and Boutwell, P. W.: Fat-Soluble Vitamine, V, Thermostability of the Fat-Soluble Vitamine in Plant Materials, ibid., p. 163.

4. Osborne, T. B., and Mendel, L. B.: Do Fruits Contain Water-Soluble Vitamine? Proc. Soc. Exper. Biol. & Med. **17**: 46 (Nov.) 1919.

5. Byfield, A. H., and Daniels, A. L.: The Antineuritic and Growth-Stimulating Properties of Orange Juice, Am. J. Dis. Child. **19**: 349 (May) 1920.

6. Seidell, A.: Pub. Health Rep. **31**: 364 (Feb. 18) 1916; Harden, A., and Zilva, S. S.: Biochem. J. **12**: 93 (June) 1918.

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8. Cohen, B., and Mendel, L. B.: J. Biol. Chem. **35**: 425 (Sept.) 1918. Chick, H.; Hume, E. M., and Skelton, R. F.: Biochem. J. **12**: 131, 1918; Lancet **1**: 1 (Jan. 5) 1918. Barnes, R. E., and Hume, E. M.: Lancet **2**: 322 (Aug. 23) 1919.

9. Flu, P. C.: Experimental Immunization Against Plague, Mededeel. v. d. Burgerl. Geneesk. Dienst in Nederlandsch Indie **8**: 18, 1919.

IMMUNIZATION AGAINST PLAGUE: AN ARGUMENT FOR CONTROLLED EXPERIMENT

The reiterated plea of scientists for accurately controlled experiments in the determination of the value of measures adopted against disease may seem to some physicians to be somewhat too emphatic. Again and again, however, the disinterested scientist is compelled to protest against the use of statistics and experiments by those commercially interested and by overenthusiastic advocates of the prophylactic use of certain products. How difficult it really is to arrive at definite conclusions relative to the efficacy of many such preventive measures is pointed out by Flu,[9] in a recent discussion of experiments on immunization against plague. The reports concerning the results of vaccination against this disease have been contradictory. Haffkine believed that he had demonstrated statistically that his vaccine was effectual in creating immunity. Bitter and other observers, analyzing the work of Haffkine, concluded that the immunity acquired was not of high degree and that it did not last more than six months. That opinions based on statistics may not be reliable, Flu illustrates by the recital of an incident occurring in the Division of Malang in Java:

> During the epidemic in the division of Malang (Java), when thousands of plague cases were occurring monthly among the inhabitants of kampongs and desa's, only one single case of plague occurred among the soldiers of the garrison in the capital Malang, being a thousand strong, in the four years the plague was raging there. This one case, was a

man with a bubo in the neck who had not been infected at the barracks, as could be ascertained almost absolutely. If at the beginning of the epidemic the garrison in Malang had been vaccinated against plague, and if the results of that measure had been judged by comparison between the numbers of plague cases among the vaccinated soldiers and among the inhabitants of Malang, then this single isolated case among the former compared to the many thousands among the latter, apparently would prove for the advantage of the vaccination. This conclusion, however, would not be admissible for a local investigation would show that the soldiers in Malang are living under much better and more hygienic circumstances than the best situated inhabitants of the kampong. The fact that the soldiers were not attacked would prove being due not to the vaccination but to the favorable conditions in the barracks, that exclude a tight contact of man and rat.[10]

Flu is able to recite other instances in which incomplete reports of plague epidemics might well be cited as strong evidence of the efficacy of the various measures employed in prophylaxis. One example is an epidemic that occurred in the dessa (village) of Sempal Wadak in Malang, a place of about 1,700 inhabitants, in which a large sugar factory is situated. At the time of the epidemic, there were about fifty European assistants, and about 300 native laborers employed there:

> In the dessa the plague was raging most heavily, 80 cases occurring there during three months. Suppose, that the Europeans had had themselves vaccinated against plague with f. i. [for instance] HAFFKINE vaccine, and that by their influence they had persuaded the natives to have done the same. Now, if only was [it were] mentioned how many people were vaccinated at Sempal Wadak and how many not, and if further was said that among the Europeans only one single case of plague occurred, while among the native labourers of the factory two cases occurred against 80 cases among the not vaccinated inhabitants of the dessa, it would wrongly appear as if the vaccination had been of excellent service. Really, these figures would not prove anything. For the Europeans were living in houses that were well protected against visits of rats and were built ratnestproof. Also the labourers of the factory came up to the requirements ordered by the house-improvement service. The only European infected had had to stay in a village-house, his own house being repaired: during his stay in the not improved village-house he was infected.

Because of such instances as these, epidemiologists have begun to be skeptical concerning statistics that are cited without the presentation of all the details necessary for an accurate judgment. The many factors entering into the causation of disease: age, sex, race, social status, occupation, residence, hygiene, house conditions—all have a definite influence. It is only by careful and repeated consideration and the employment of numerous controls that the relative importance of each factor can be estimated in any degree approaching accuracy.

As a result of his consideration of the subject, Flu determined that the only experiments on plague that can be considered of any real value are those on animals, since it is impossible to secure perfectly controlled conditions in such work on man. Experiments of this kind he carried out in great detail, using large numbers of animals. Of all the vaccines examined, only the aqueous extracts were found to have any definite immunizing power. However, as only a low percentage of immunized animals survived injections with large doses of bacteria, he concludes that the expectation that in the course of time some method of immunization against plague may be found which will be effective in 100 per cent. or even 90 per cent. of the cases treated is at present absolutely in vain. That this is the case is supported by the fact that even a natural infection of this disease is not capable of conferring definite immunity.

10. The periodical from which this quotation is taken is published in Java; each page contains two parallel columns, one Dutch, the other English. The English is not always strictly grammatical, as will be noted from the portions cited.

Current Comment

REPUBLICAN PLATFORM AND HEALTH AND EDUCATION

In the General News column [1] appears the full text of the plank on education and health adopted last week by the Republican convention. The association of these two subjects in a single section is significant of the increasing realization of the close relation and mutual interdependence of health and education. Good health either of the individual or of the community is largely a matter of education. All true education results in better health. In the joint development of these closely allied activities there is room and need for the specialist and expert in both fields. Possibly most of our readers will be especially interested in the paragraph that points out that the health activities of the federal government are scattered through numerous departments and bureaus, resulting in inefficiency, duplication and extravagance. It very wisely limits its recommendations to greater centralization of federal functions and better coordination of federal, state and local agencies, without attempting to discuss the exact method by which this result is to be secured. The reorganization and extension of federal public health work has been under discussion for half a century. While all are agreed as to the desirability of such expansion, there is no unanimity as to the exact method by which it should be accomplished or the form it should take. These questions can be answered only after careful study of existing conditions in order to determine what the federal government is now doing for public health, how much is being expended and what is being accomplished, what are the public health functions which belong to the federal government, what are those which belong to the state, and how coordination can be best effected. These are not questions for either partisan or sectarian controversy but rather for patient study and constructive planning. Whatever may be our differences of opinion as to the peace treaty with Germany, the League of Nations or the high cost of living, all good citizens are agreed as to the importance of both education and health. It is to be hoped that the Democratic convention at San Francisco will make an equally broad and constructive declaration on these two subjects.

1. Page 1724, this issue.

PUBLIC HEALTH POETRY

Poets, we are told, are born, not made. But every one has a sense of rhyme and rhythm. Rhyme and rhythm aid memory—they have "catchy" qualities. As a result we have not only spring as the open season for poets but also a year round open season for the public health poet. He takes a simple hygienic slogan, such as "Flies breed disease—swat 'em," and turns out poetry of a practical sort:

"The fly, also, is a nuisance, very small,
The greatest pest, I'm sure, of them all.
In the daytime it is humming, humming though it has no song,
If the city is kept clean, it will disappear ere long."

See how easy it is to write "poetry." One merely measures off so many centimeters of line and puts a big letter on the front. Let us suppose it is desired to inform a nervous public that mosquitoes carry malaria. Does the public health poet hesitate?

"Did you know mosquitoes bring
Other things besides their sting?
Sometimes when they bite, they leave you
With malaria or with fever.
Dry up all the stagnant places—
Breeding places of all their races;
Keep your screen doors closed, and fling
Defiance to Sir Skeeter's sting!
Let your slogan through the summer
Be to kill this wicked hummer."

Simple, isn't it? Yet it gets there all the same. But the subjects have been too broad, too indelicate! Now for something really practical and esthetic:

Oh! blessings on the garbage man:
He comes around and gets our can;
He cleans it up quite nice and neat—
Then it leaks out of his wagon and is scattered all over the blooming street.

ANTHRAX AND THE SHAVING BRUSH

Previous to 1914, anthrax infection in nearly all instances occurred only among those who came in contact with cattle, hides, meat or wool; but soon after the outbreak of the war, numerous cases appeared among persons who had not been associated with any of the usual known sources of the disease. From time to time, outbreaks of anthrax developed among soldiers of both England and the United States, and careful investigation revealed that nearly all cases developed from shaving wounds. It was later found that certain types of shaving brushes harbored virulent anthrax bacilli. Shaving brushes used in this country are for the most part made from badger hair, horsehair or pig bristles, though much of the so-called badger hair is an imitation made by treating white hair or bristles. Until the war, nearly all the horsehair and pig bristles came from Russia, China and Japan, after being cleaned and disinfected in France or Germany. But after 1914 they were shipped directly to this country by the Pacific route. With the advent of the war, the unusual demands on the shaving brush industry necessitated such a rapid output that some manufacturers, through ignorance, carelessness or too great confidence in the certificates of disinfection, made no effort to insure the safety of the material used. The horsehair from China is notoriously dirty, very likely anthrax-infected, and shipped with "no indication of manner or methods of treatment."[1] Domestic hair dealers, principally in Chicago, wash the hair with soap or lye in warm water, but there is no established method to make the hair safe from anthrax. A number of these cleansing processes were investigated;[1] some were found to be thoroughly satisfactory, others certainly offered no guarantee of safety, and there is no doubt that there are now on the market many brushes potentially dangerous, most of these being of the cheaper grades. At present the methods of disinfection used by the manufacturers of shaving brushes are not standardized, and many are inefficient. In England from June, 1915, to October, 1916, fourteen cases[2] of anthrax infection are known to have originated from shaving brushes. In nearly all instances a recently purchased brush had been used a few days before the appearance of the malignant pustule. Virulent anthrax bacilli were found on the patient's brush and on others obtained from the same lot. A rather low human susceptibility was indicated by the fact that only one case is known to have developed from a lot of 10,000 brushes, though anthrax bacilli were found in all samples examined. In this country, twenty-four cases of anthrax from shaving brush infection[3] have been recorded; in six instances the bacilli were isolated from brushes used. It is of interest to note that several cases of meningitis were encountered, anthrax bacilli being isolated from bloody spinal fluid. In three instances, no evidence of an external lesion was found. In thirty-three cases of shaving brush anthrax, twenty-one, or 64 per cent., of the patients died;[4] this high mortality may be due to the site of infection, wounds of the neck being more serious than elsewhere. By the use of proper methods, anthrax infection from shaving brushes is entirely and easily preventable. Systematic inspection and definite requirements of sterilization will eliminate the shaving brush as a source of anthrax infection. Boiling, exposure to streaming steam, or soaking the material for four hours in 10 per cent. dilution of liquor formaldehydi at 110 F. are said to be reliable methods of disinfection.

1. An Investigation of the Shaving Brush Industry, with Special Reference to Anthrax, Pub. Health. Rep. **34**: 994 (May 9) 1919.
2. Anthrax from Shaving Brushes, Pub. Health Rep. **33**: 115 (July 12) 1918. Coutts, F. H.: Reports, Local Govt. Board of Public Health and Medical Subjects, N. S. 112, 1917.
3. Carey, H. W.: Anthrax from the Shaving Brush and Primary Anthrax Meningitis, Am. J. M. Sc. **159**: 742 (May) 1920.
4. Footnote 2, first reference.

Increase in Automobile Accidents.—According to the annual report of the National Highways Protective Association, the total toll of life taken by motor cars throughout New York State during 1918 was 969 persons. The death list in New York City was 528, as against 417 for 1917. Of 441 fatal accidents that occurred outside the metropolitan area, 416 occurred between April 1 and December 31, and only twenty-five between January 1 and March 31. The president of the National Highways Protective Association recommends a law for New York State similar to that in Massachusetts. Connecticut, New Jersey and Maryland, which in New Jersey has been responsible for cutting down the number of fatal accidents from 245 in 1917 to 197 last year.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Graduate Courses in Hygiene.—The University of Alabama is establishing a department of hygiene in which graduate students will be prepared to teach hygiene and health conservation in colleges, normal schools or other like institutions. Satisfactory completion of the course will qualify for the degree of Bachelor of Science in Hygiene. There is immediate need of such graduates in the school health activities of the state. Dr. Hiram Byrd, formerly director of the department of hygiene in the University of Mississippi, is head of the new department.

ARKANSAS

Personal.—Dr. Keith E. Hudson, Dahome, has announced his retirement from the practice of medicine.——Dr. Fergus O. Mahoney has been elected president, and Dr. H. H. Niehuss, secretary, of the Eldorado Board of Health.

District Society Organized.—Greenwood District Medical Society was recently organized, with an initial membership of seventeen, and the following officers were elected: president, Dr. George G. Woods, Huntington; vice president, Dr. Bert L. Ware, Greenwood, and secretary-treasurer, Dr. Charles W. Hall, Greenwood.

State Isolation Hospital Planned.—The leaders of the public health movement in Arkansas are planning to build and equip a state isolation hospital and venereal disease clinic which will not only provide treatment, isolation and detention for commercial prostitutes in all places of the state where there are no clinical facilities or means of isolation, but will also give treatment in all cases of venereal infections in persons committed to the girl's industrial school and to the woman's reformatory.

State Society Election.—At the annual meeting of the Arkansas Medical Society held at Eureka Springs, June 8 and 9, under the presidency of Dr. George S. Brown, Conway, the following officers were elected: president, Dr. Gus A. Warren, Black Rock; vice presidents, Drs. Robert Howard Huntington, Eureka Springs, Andrew J. Clingan, Lockesburg, and Thad Cothern, Jonesboro; secretary and editor of the *Journal of the Arkansas Medical Society*, Dr. William R. Bathurst, Little Rock (reelected); treasurer, Dr. Henry H. Kirby, Little Rock. Hot Springs was selected as the place of meeting for 1921.

FLORIDA

Personal.—Dr. Lorin A. Greene, Greenville, has been appointed superintendent of the new Florida Colony for Feebleminded and Epileptics.——Dr. William J. Buck, Jacksonville, has resigned as assistant state health officer.

New State Officers.—At the forty-seventh annual meeting of the Florida Medical Association held in Daytona, May 12 and 13, under the presidency of Dr. Ralph N. Green, Chattahoochee, the following officers were elected: president, Dr. William E. Ross, Jacksonville; vice presidents, Drs. Clyde C. Bohannon, Daytona, George A. Davis, De Land, and James H. Fellows, Pensacola, and secretary-treasurer, Dr. Graham E. Henson, Jacksonville. Pensacola was selected as the next place of meeting.

Venereal Disease Clinic Established.—Seminole and Gadsden counties have joined hands with the state board of health, in its efforts to establish a venereal disease clinic in each of the counties of the state. The Seminole County Clinic is in operation at Sanford, and the Gadsden County Clinic at Quincy. Ten clinics are now in operation, the stationary clinics being located at Key West, Miami, Tampa, Arcadia, West Palm Beach, Jacksonville, Pensacola, Lake City and St. Petersburg in addition to an ambulatory clinic under the charge of Dr. John C. Bertram, Jacksonville.

Possible Deaths from Bubonic Plague.—The state laboratory, on June 13, announced that the death of George Gardina in Pensacola, June 11, was undoubtedly due to bubonic plague and that steps had been taken for an immediate cleanup campaign. Health officials of the state have determined on a thorough extermination of rats.——The officials of the Public Health Service in Washington, D. C., say that it has not yet been definitely established that a case of bubonic plague had developed in Pensacola.——A second case of bubonic plague was officially reported to the authorities of Pensacola, June 15. The patient is an ice wagon driver, and his duties took him through the section of the city where the first case was discovered.

ILLINOIS

Chicago

New Officers.—Dr. John S. Nagel was elected president-elect, and Dr. Hugh N. MacKechnie, secretary of the Chicago Medical Society at the annual election, June 16.

Northwestern Alumni Meeting.—At the annual meeting of the Northwestern University Alumni Association held in Chicago, June 14, the following officers were elected: president, Dr. Franklin H. Martin, '80; vice presidents, Drs. John F. Williams, '65, and Robert Blessing, '20; secretary-treasurer, Dr. James G. Carr, '02, and necrologist, Dr. Samuel C. Stanton, '92 (reelected).

Guthrie Memorial.—At the meeting of the council of the Chicago Medical Society, June 8, a resolution was adopted providing that a proper inscription setting forth the facts of Dr. Samuel Guthrie's discovery of chloroform be placed on the glacial boulder at the entrance of Washington Park, at Garfield Boulevard, known as the Guthrie Stone. This resolution was referred to the committee appointed last year regarding the Guthrie memorial.

University of Illinois Alumni Meeting.—The annual meeting of the Alumni Association of the College of Medicine of the University of Illinois was held in Chicago, June 5, and the following officers were elected: president, Dr. Karl Meyer, '08; president-elect, Dr. Louis J. Hammers, '02; vice presidents, Drs. William H. Bradley, '10, Charles H. Hallberg, '11, and William B. West, '06; secretary and treasurer, Dr. John M. Krasa, '13 (reelected), and necrologist, Dr. O. McWilliams, '99.

MAINE

District Health Officers' Ranks Completed.—By the appointment of Dr. Adin L. Smith, Machias, as district health officer for Hancock and Washington counties, the roll of district health officers of Maine is completed, making a total of eight for the state.

Public Health Association Reorganized.—The work of the Maine Anti-Tuberculosis Association has been transferred to the newly organized Maine Public Health Association, which at its recent meeting in Bangor elected the following officers: president, Dr. Elmer D. Merrill, Foxcroft; vice presidents, Mr. E. M. Hamlin, Milo, Dr. Sylvester J. Beach, Augusta, and Mr. Henry Richards, Gardiner; executive secretary, Mr. W. A. Harris; secretary, Mrs. Howard Ives, Portland, and treasurer, Mr. Ralph Whittier, Bangor. The reorganization was undertaken for the purpose of entering a broader line of work than was possible under the old name and by-laws. Now prenatal care, child welfare and venereal diseases as well as tuberculosis work will be included in its program. One aim in the reorganization is to unify under one head all private health organizations of the state as rapidly as possible and to work more closely with the state department of health, school department, department of charities and corrections and other departments.

MARYLAND

Patients Ordered to Fort McHenry.—Dr. Charles W. Vogel, in charge of the United State Marine Hospital, Baltimore, has received orders from the Surgeon-General, U. S. Public Health Service, to transfer all patients and personnel to the public health hospital at Fort McHenry. The hospital at Fort McHenry is not ready to receive patients, but every effort is being made to put it in order and at the latest it is expected to be ready by July 15. The future fate of the Marine Hospital has not yet been determined.

Gift to Johns Hopkins.—A gift of $400,000 has been made to the General Education Board of the Rockefeller Foundation Fund for the establishment of a department of pathology at the Johns Hopkins Medical School, and is the second appropriation of that amount to the school in less than four months. An appropriation of like amount from the same source was announced for the establishment of a women's

clinic at the hospital several months ago. The present fund is given contingent on the university's raising an additional $200,000 toward a $600,000 fund. The present gift is to be used in rebuilding the pathologic department which was destroyed by fire last January. Work on the new pathologic department will be started as soon as the additional $200,000 is raised by the university.

Infectious Hospital Planned for Baltimore.—An ordinance submitting to the voters of Baltimore in November a loan of $750,000 for an infectious disease hospital has been introduced in the city council. The loan was authorized by the legislature of 1914, but was pigeon-holed by the former administration. It was resurrected by Dr. C. Hampson Jones, health commissioner, who considers the hospital one of the pressing needs of the city. It is estimated that the municipal hospital will cost approximately $1,000,000 to start with. The city is soon to receive $177,000 from the federal government for the quarantine station. This added to the $750,000 from the loan, if approved, will give the health department sufficient money for its needs. It is understood that the medical fraternity is solidly behind the hospital loan and that their influence will aid the public improvement loan materially.

MASSACHUSETTS

New State Officers.—At the one hundred and thirty-ninth annual meeting of the Massachusetts Medical Society held at the Boston Medical Library, June 8 and 9, Dr. Alfred Worcester, Boston, was elected president; Dr. Frederick E. Jones, Quincy, vice president; Dr. Walter L. Burrage, Boston, secretary (reelected); Dr. Arthur K. Stone, Framingham Center, treasurer; Dr. Edwin H. Brigham, Brookline, librarian.

Physicians Oppose Bill for State Maternity Aid.—In a circular letter to members of the legislature, four medical societies in the state, namely, the Worcester North District, Worcester South District, Franklin District and Fitchburg medical societies declare their opposition to the passage of a bill to provide maternity benefits for needy expectant mothers. This proposed legislation is considered as paternalistic and class legislation and as an infringement on the rights of individual citizenship.

MISSISSIPPI

Home for Feebleminded.—Meridian is making strenuous efforts to obtain the location of the proposed state colony for the feebleminded, to secure which, a donation of $100,000 and a 1,000 acre site are essential.

Typhoid Vaccine Available.—Dr. Clyde R. Stingily, Jackson, bacteriologist of the state board of health, announces that he has now a sufficient quantity of typhoid vaccine for 30,000 cases and is ready to ship this to physicians of the state free of all expense.

NEBRASKA

Hospital Transferred.—The new Lord Lister Hospital, Omaha, has been taken over by the Danish Hospital Association. The institution will open this month and will have accommodation for 150 patients.

Alumni Meeting.—The annual meeting of the John A. Creighton Medical College Alumni Association was held, June 2 to 4. During these days, clinics were held at St. Joseph's Hospital, and on June 4, Dr. Henry S. Plummer of the Mayo Clinic delivered an address on "The Function of the Thyroid Gland."

Graduate Clinical Week.—A graduate clinical week was held, June 7 to 13, at the University of Nebraska, College of Medicine, Omaha. Emphasis was placed on social diseases as subjects for study and demonstration. Daily ward walks through the university hospital, and laboratory work in clinical pathology were some of the practical features of the week.

NEW YORK

Encephalitis Made Reportable.—Lethargic encephalitis has been added to the list of reportable communicable diseases by action of the public health council of the state department of health.

Tuberculosis Lecture Outline.—An outline of a lecture on tuberculosis for use before lay audiences in connection with the set of lantern slides belonging to the state department of health is now available and may be obtained by writing to the supervisor of exhibits, state department of health, Albany.

Health Clinics.—The New York State Department of Health in cooperation with the state department of education, state hospital commission, state committee for mental defectives, tuberculosis committee of the state charity aid association, and Atlantic Division of the American Red Cross inaugurated a series of group medical consultation clinics held at the Village Hall of Geneseo, June 8, 9 and 10.——At the clinic held in Rome, May 12, by Dr. Sydney F. Blanchet, Saranac Lake, twenty-five persons were examined for tuberculosis.

New York City

Personal.—Dr. George D. Wolf has been appointed adjunct professor of otology and rhinology in the Bronx Hospital and Dispensary.

Guarding Against Plague.—Owing to the outbreak of bubonic plague in Vera Cruz, the health authorities of the city are acting in cooperation with Dr. Leland E. Cofer, health officer of the port, in an effort to strengthen the lines of defense against the importation of the disease. Cyanid is being used for fumigation of all vessels from any suspected port. A careful sanitary inspection is being made of all city piers.

Milk Charity Transfer.—Nathan Strauss, before sailing for Palestine where he expects to devote himself to relief work, on June 11, made a statement to the mothers of the city of New York stating that he felt that his task of furnishing pasteurized milk to the babies of New York was finished, and that his milk stations would be discontinued after September 1. The work will be continued during the summer, he says, in order to give mothers the opportunity to visit his laboratories and learn methods for the home modification of milk. He has offered to turn over to the city his milk laboratory complete, with all its equipment and motor trucks, provided the city supplies funds to maintain and expand the work.

Tuberculosis Activities.—The first public meeting of the New York Tuberculosis Association was held, May 18, Dr. James Alexander Miller, presiding. Dr. Miller told of the work for the vocational training of soldiers and sailors who have now been transferred to civilian control; Mr. Fred M. Stein explained in full the plans of the workshop to be established in Long Island City; Mr. T. B. Kidner of the National Tuberculosis Association spoke on the "Rehabilitation of Consumptives to Industry"; Dr. C. Floyd Haviland, Middletown, Conn., delivered an address on "Occupation and Treatment in Convalescence," and Dr. John S. Billings presented the plan of the association for the reconstruction of the consumptive. This includes an application bureau as a part of its information bureau, and an employment bureau. A group of the larger sanatoriums in the vicinity of New York City have agreed to cooperate with the association by establishing schools for the vocational training, especially of service men.

OHIO

New State Officers.—At the seventy-fourth annual meeting of the Ohio State Medical Association held in Toledo, June 1 to 3, Dr. Charles Lukens, Toledo, president-elect, was installed as president, and the following officers were elected: president-elect, Dr. Wells Teachnor, Columbus; president emeritus for one year, Dr. John C. Reeve, Dayton, the oldest member of the association (this position is honorary and is granted in recognition of unusually distinguished ability or service). Columbus was selected as the next place of meeting.

New Sanitary Code.—The Ohio Sanitary Code was submitted to the public health council of the state department of health for approval, May 14, and this code will become effective July 1, 1920, on which date all rules and regulations formerly adopted by the state board of health or public health council are repealed. The new code consists of regulations regarding the reporting of communicable disease, naming the ailment according to its classification as a dangerous disease and stating who is responsible for the report. It includes provisions for notification of such diseases as are found in institutions and for the reporting of deaths from notifiable diseases to the state board of health. It embodies the necessary measures for the prevention and control of communicable diseases, including quarantine, isolation and disinfection. Provisions are also included for the transportation of the dead, and for the inspection and examination of school teachers, janitors and children. Essential rules have been drawn up for the operation of tuberculosis and maternity hospitals, including provisions for the record of the patients, advice as to equipment and medical supervision, and regulations as to examination and treatment.

The new code also has a section dealing with the maintenance of sanitary control of the state park sanitary district, the construction of sewage disposal plants, removal of garbage and the protection of food from flies and dust.

OREGON

Alumni Meeting.—The eighth annual meeting of the Alumni Association of the Medical School of the University of Oregon was held in Portland, May 31 to June 2. This was known as the MacKenzie Memorial meeting, and the program consisted of clinics at five hospitals and the reading of papers at the afternoon sessions. Dr. Ludvig Hektoen, Chicago, delivered the Noble Wiley Jones lectures under the auspices of the medical school on Monday and Wednesday evenings, on the subjects, "Phases of Streptococcic Infection," and "Old and New Knowledge of Immunity." On Tuesday, the annual banquet and business meeting was held, and the following officers were elected: president, Dr. Otis F. Akin, '09, Portland; vice presidents, Dr. George A. Cathey, '09, Portland; Carl J. Hoffman, '02, Woodland, Wash.; Charles L. Rybke, '09, Portland, and Christian E. Stafrin, '11, Portland; secretary, Dr. Adalbert G. Bettman, '07, Portland, and treasurer, Dr. Kitty Plummer Gray, '00, Portland.

PENNSYLVANIA

Ambulance Men Meet.—More than 500 registered for the first U. S. A. A. A. C. reunion of soldiers of the United States Ambulance Corps, gathered at Camp Crane on the Allentown fair grounds, June 8.

Physicians' Golf Club Organized.—The Aesculapius Golf Club has been organized at Pittsburgh with Dr. Lee V. L. Brown, Castle Shannon, president; Dr. Jesse S. Demuth, Pittsburgh, vice president, and Dr. Edward J. McCague, Pittsburgh, secretary-treasurer.

Death of Noted Chemist.—Dr. Leonard Merritt Liddle, aged 36; senior industrial fellow of the Mellon Institute of Research, Pittsburgh, since 1912, and from 1914 to 1916 head of the biochemistry department of the University of Pittsburgh School of Medicine; president of the Robert Kennedy Duncan Club; a chemist of marked ability in research; died, February 21.

Philadelphia

Physical Directors Visit Colleges.—Members of the Middle Atlantic Physical Directors' Society, in session in Philadelphia, visited Jefferson and Hahnemann medical school, June 11, and heard lectures on medical problems relating to physical education.

Personal.—Dr. Miriam Warner has been appointed physician in the bureau of charities and corrections by Director Ernest L. Tustin of the department of public welfare, and will have charge of treatment of all women at the Home for the Indigent at Holmesburg and the House of Correction. ——Dr. John E. B. Buckenham, superintendent of the City Hospital for Contagious Diseases since 1914, has resigned to become librarian of the Masonic Grand Lodge of Pennsylvania.

CANADA

Doctors Increase Fees.—Hamilton, Ont., physicians are the latest to increase their fees. Hereafter daily calls will be $3; emergency calls and night calls after 6 p. m., $5; office visits, $1.50, and obstetric cases, $25.

Measles and Smallpox in Ontario.—The epidemic of measles in Ontario is growing. From a total of 3,768 cases of communicable diseases reported during May, the cases of measles numbered 2,264 with forty-five deaths. Two hundred and ninety cases of smallpox were reported with no deaths.

Director-General Resigns.—Major-Gen. John Taylor Fotheringham, C. M. G., who has for the past few years been director-general of Canadian Military Medical Services, with distinguished service overseas, has resigned and has left Ottawa to take up practice in his old home in Toronto.

Dominion Association Meeting.—The fifty-first annual meeting of the Canadian Medical Association will be held in Vancouver, B. C., June 22 to 25, under the presidency of Dr. Robert E. McKechnie, Vancouver. The address in medicine will be delivered by Dr. Charles Lyman Greene, St. Paul, Minn., on "Certain Fundamental Errors in the Diagnosis of Myocardial Insufficiency"; that in surgery, by Dr. Edward W. Archibald, Montreal, on "The Surgical Treatment of Ulcerated Intestinal Tuberculosis, as Occurring Chiefly in the Course of Pulmonary Tuberculosis"; that in orthopedics, by Dr. Virgil P. Gibney, New York City, on "Development and Scope of Orthopedic Surgery," and that in public health, by Dr. John Amyot, Ottawa, Ont., on "The Federal Government and Public Health." Symposiums will also be held on goiter, pulmonary abscess and the stomach and duodenum.

GENERAL

New Officers for Examining Board Federation.—At the annual meeting of the New England Federation of Medical Examiners held in Boston, June 1, Dr. Charles Duncan, Concord, N. H., was elected president; Dr. Michael F. Fallon, Worcester, Mass., vice president, and Dr. Samuel H. Calderwood, Boston, secretary.

Roentgenologists to Meet.—The American Roentgen-Ray Society will hold its twenty-first annual meeting in Rochester and Minneapolis, Minn., September 14 to 17, under the presidency of Dr. James T. Case, Battle Creek, Mich. The sessions of the first day of the meeting will be in Rochester and of the following three days in Minneapolis.

International Sanitary Conference.—At a recent meeting of the committee on arrangements for the Sixth International Sanitary Conference to be held in Montevideo, Uruguay, December 12 to 20, plans for the conference were formulated, and it was recommended that invitations be extended to all the countries of North and South America to assist in the conference.

Medico-Psychologists Hold Meeting.—At the annual meeting of the American Medico-Psychologic Association held in Cleveland, June 1 to 4, Boston was decided on as the next place of meeting, and the following officers were elected: president, Dr. Owen Copp, Philadelphia; vice president, Dr. Sanger Brown, Chicago, and treasurer, Dr. Harry W. Mitchell, Warren, Pa.

General Gorgas Abandons Trip.—Major-Gen. William C. Gorgas has been obliged to abandon his mission to West Africa where he was to investigate sanitary conditions under the auspices of the Rockefeller Foundation. General Gorgas recently suffered a cerebral hemorrhage, complications developed and his condition remains serious. He will probably return to the United States as soon as he is able to travel.

Disposal of Army Medical and Hospital Supplies.—The surplus property division of the office of the Quartermaster General at Washington is offering for sale large quantities of various medical and hospital supplies. A list of these supplies was published on advertising pages 38 and 39 of THE JOURNAL for April 24, 1920. Lists of articles that are still unsold are being furnished on application to Director of Sales, Munitions Building, Washington, D. C.

Rockefeller Gifts to Medical Work.—The General Education Board of the Rockefeller Institute announces a gift of $5,000,000 to the Rochester University to be used in conjunction with a second $5,000,000 donated by George Eastman for the founding of a school of medicine and dentistry. A second gift of £1,250,000, with additional smaller sums, is to be given the London University College and Hospital School for a building program whereby the facilities of the college are to be extensively improved for the training of personnel and the setting of standards for health work throughout the British Empire.

Venereal Disease Survey.—Surgeon-General H. S. Cumming, U. S. Public Health Service, announces that approximately 465 of the larger cities of the United States have been surveyed to determine the measures in force for combating venereal diseases. These data are to be published shortly. In four or five months another study of the same localities will be made and the results published. In order that this public health problem may be successfully handled, the cooperation and support of the members of the American Medical Association, its constituent state associations and their component county societies is solicited. The Surgeon-General is desirous of having the support both of these correlated organizations and the influence of their members as leaders in lay organizations—churches, Y. M. C. A., Y. W. C. A., fraternal bodies, rotary clubs, women's clubs and similar societies.

Republican Health Plank.—The following plank on education and health was adopted by the Republican National Convention:

We endorse the principle of federal aid to the states for the purposes of vocational and agricultural training.

Wherever federal money is devoted to education, such education must be so directed as to awaken in the youth the spirit of America and a sense of patriotic duty to the United States.

A thorough system of physical education for all children up to the age of 19, including adequate health supervision and instruction, would remedy conditions revealed by the draft and would add to the economic and industrial strength of the nation. National leadership and stimulation will be necessary to induce the states to adopt a wise system of physical training.

The public health activities of the federal government are scattered through numerous departments and bureaus, resulting in inefficiency, duplication, and extravagance. We advocate a greater centralization of the federal functions, and in addition urge the better coordination of the work of the federal, state, and local health agencies.

LATIN AMERICA

Yellow Fever in Brazil.—Our Brazilian exchanges mention that several cases of yellow fever have been reported recently at Bahia, and several deaths have occurred at different points in the Alagóas region to the northeast.

Plague in Mexico.—According to the last reports, two new cases and three suspected cases of plague have been reported at Vera Cruz, and two deaths among those previously stricken. Two cases were also reported at Tampico.

Personal.—Dr. A. Neiva, chief of the public health service of the state of S. Paulo, Brazil, has been commissioned by the authorities to study the organization of the public health service in Japan and the United States, and the prophylaxis of leprosy in Norway, the Philippines and Hawaii.

Society Election.—The Sociedad de Cirujia of Buenos Aires recently elected as president, Dr. D. J. Cranwell; vice president, Dr. E. Beláustegui; treasurer, Dr. M. Viñas; secretary, Dr. R. Pasman; director of the *Revista*, Dr. D. A. Ceballos, and other directors Dr. P. Chutro and Dr. D. F. Prando.

Election of Officers.—The officers elected for the 1920-1922 term of the Asociación Médica Argentina are Dr. P. Escudero, president; Dr. J. S. Passeron, vice president; Dr. C. Domínguez, secretary general; Dr. J. Iribarne, director of the council on publications; Dr. E. Fidanza, treasurer, and Dr. R. A. Rivarola, librarian.

New Military Hospital at S. Paulo.—The corner stone of the new military hospital was laid in 1918 and it was recently inaugurated with much ceremony by state and military authorities. It was completed in eighteen months at an expense of about $369,000 Major Affonso Ferreira is to be the director of the new hospital.

FOREIGN

New Dermatologic Journal.—With the name *Acta dermato-venerologica* a new journal has been founded by physicians in the Scandinavian countries, to be published in the three main European languages as material accumulates. The editor-in-chief is Professor Almkvist, Sjukhuset St. Gjóran, Stockholm. Each volume is to include about 500 pages, and the subscription to the volume is 20 Swedish crowns.

Health Survey of Haiti.—Dr. John Swan, who was recently sent to the Dominican Republic and Haiti by the American Red Cross to make a survey of sanitary and health conditions, reports an urgent need for help, especially as regards modern medical treatment and sanitary housing. In his opinion, immediate steps should be taken to fight venereal disease, hookworm, malaria, and yaws, to establish antituberculosis measures and to teach personal hygiene.

Vital Statistics of Portugal.—According to figures published in the *Medicina contemporanea* the average rates for the years 1913 to 1917 per thousand inhabitants of Portugal and the Azores and Madeira islands were 6.10 marriages, 31.13 births and 20.13 deaths. The figures for Lisbon alone are 7.25 marriages, 24.29 births and 21.91 deaths. The death rate in the home country has increased during the five years from 20.52 to 21.50. The losses by emigration averaged 5.30. The population of Portugal in 1911 was 5,957,985.

Medical History of the World War.—Portugal was among the first nations to send a civilian medical unit to the front. Dr. Reynaldo dos Santos of Lisbon organized the unit and was in charge of it in France, long before Portugal entered the war. The profession in Portugal is now collecting data to compile the medical history of the war. To inaugurate this task, the *Medicina contemporanea* is publishing a list of the titles and a bibliography of articles that have appeared in Portuguese journals, society transactions or elsewhere, bearing on the war.

The Parkin Prize.—In the terms of a bequest made to the Royal College of Surgeons, Edinburgh, by the late Dr. John Parkin, a fellow of the college, a prize is offered for the best essay on "The Curative Effects of Carbonic Acid or Other Forms of Carbon in Cholera, for Different Forms of Fever and Other Diseases." The prize is 100 pounds sterling. The contest is open to competitors of all nations. Essays intended for competition must be written in the English language, must bear a motto and be accompanied by a sealed envelope bearing the motto outside and the name of the author inside, and must be received by Dr. J. S. Fowler, secretary of the college, not later than December 31.

Deaths in Other Countries

Dr. **A. Suazo** of Comayagua, Honduras.——Dr. **J. J. Naón** of Tucuman, Argentina, professor of anatomy at the university of Buenos Aires until his resignation in 1906.——Dr. **F. T. Christen,** a well known roentgenologist of Lausanne, was drowned recently.——Dr. **Karl Toldt**, professor emeritus of anatomy at the University of Vienna, aged 80.

CORRECTION

Pathological and Not Bacteriological.—In THE JOURNAL of May 1, an Alabama item stated erroneously that the Birmingham Bacteriological Society was formed on March 17 with fourteen members. The society referred to is the Birmingham Pathological Society which was organized on that day, with thirty members.

Error in Discussion of Syphilis.—Dr. G. E. Humphrey, Cambridge Springs, Pa., calls attention to the fact that in the discussion of a paper by Dr. Sanger Brown on "Syphilis," THE JOURNAL, June 5, page 1569, Dr. S. W. Lindsay of Topeka, Kan., says: "Twenty years ago I treated a young man who had syphilis, with the old time salvarsan." Dr. Humphrey calls attention to the fact that salvarsan was not introduced until about 1910.

Government Services

Army Medical School Graduation

The commencement exercises of the Army Medical School were held May 28, in the new National Museum Auditorium, Washington, D. C., Major-Gen. Merritte W. Ireland, Surgeon-General, U. S. Army, presiding. Newton D. Baker, Secretary of War, addressed the graduates and presented the diplomas. The Hoff Memorial Medal was awarded to Major Seymour C. Schwartz, M. C., U. S. Army, and was presented by Major-Gen. Merritte W. Ireland; the Sternberg Medal was awarded to Lieut. August Pacini, M. C., U. S. Army, and was presented by Col. Richard Sternberg, and the Skinner Medal was awarded to William O. Callaway, and was presented by Major John O. Skinner, M. C., U. S. Army, retired. A class of twenty-seven was graduated.

Health Conditions of the Army

Health conditions among troops in the United States continue excellent as evidenced by the decrease in the admission and noneffective rates. There were three new cases of pneumonia reported during the week from Camp Taylor, which for the last few weeks has been reporting a number of sporadic cases of measles. The number of admissions for influenza and measles show a slight increase over last week. There were fifteen new cases of influenza reported during the weeks all from the Eastern Department. The death rate for disease, 4.0, is considerably higher than last week, 2.7. Of thirteen deaths from disease reported, tuberculosis was given as the cause in four, pneumonia and scarlet fever, one each, and streptococcic meningitis three.

MEDICAL OFFICERS, UNITED STATES NAVY, RELIEVED FROM ACTIVE DUTY

ILLINOIS

Chicago—Merrill, L. C.

LOUISIANA

New Orleans—Thomas, G. A.

MASSACHUSETTS

Boston—Meledy, J. A.
Redden, W. R.

NEW YORK

Brooklyn—Cragin, H. S.

PENNSYLVANIA

Dudley—Dovey, H. L.

TEXAS

Tyler—Pope, I., Jr.

Foreign Letters

PARIS

(From Our Regular Correspondent)

May 27, 1920.

Our Present Knowledge of Immunity

Since 1901, when Metchnikoff published his classic work on immunity, our knowledge of the phenomena of immunity has been considerably augmented, especially in the domain of serology. It is no exaggeration to state that the study of these phenomena has been raised to the status of a distinct and independent science. Unfortunately, up to the present, the fundamental literature of this new science is scattered in the special periodicals. We are in need of a general statement of the laws of immunity. No one was better qualified to make such a statement than Prof. Jules Bordet, director of the Pasteur Institute of Brussels. The works of Bordet have, in fact, played an important rôle in the progress of immunology, for it is only since 1898, with Bordet's discovery of hemolytic serums, that the question of the resistance of the organism to pathogenic agents has been able to assume an important position. Bordet's "Traité de l'immunité dans les maladies infectieuses" (just published by Masson et Cie, Paris) undoubtedly represents the most complete exposition of the problem of immunity which has yet appeared. It deserves being called to the special attention of the American medical profession, for the study of immunity has always created a lively interest in the United States. The organization of the American Association of Immunologists in itself sets a good example to the Old World.

Indications for Heliotherapy

At the congress for the promotion of mineral water, climatic, bathing and mountain health resorts, recently held at Monaco, Dr. d'Oelsnitz of Nice made an interesting report on heliotherapy as an auxiliary to climatic treatment.

In surgical tuberculosis marine heliotherapy is apparently the agent of choice. But mountain resorts should not be ignored. Less stimulating than the northern sea coast, they are still the preferable indication for certain nervous and excitable patients. Tracheobronchial tuberculosis is clearly admitted in the list of diseases amenable to treatment by sunlight. In pulmonary tuberculosis, on the other hand, despite early enthusiasm, there is a growing tendency away from this measure. Sunlight can be applied with advantage in pleural tuberculosis after disappearance of the effusion. In pulmonary tuberculosis, heliotherapy often exerts a prophylactic action by arresting the development of glandular foci. For injuries, and atonic and infected wounds, heliotherapy should be employed no matter where. This is not true of disorders of general nutrition, digestive and nervous affections; these are amenable to heliotherapy only secondarily or accidentally, and climatic treatment is always the primary indication. An exception should be noted in rickets, in which heliotherapy at the seaside is the elective treatment. In his conclusions, Dr. d'Oelsnitz insisted on the necessity of subordinating, by attentive observation of the individual reactions, the intensity of treatment to the local and general effects produced in a given case. In a word, the indications for, and the dosage and technic of heliotherapy, aside from a few approximate rules, must still be based more on the individual patient than on climatic factors.

The congress, agreeing with these conclusions, resolved that because of possible accidents and complications, heliotherapy should always be subjected to medical supervision.

Antituberculosis Campaign of Red Cross Societies

The last number of the *Bulletin de la Comité National de defense contre la tuberculose* is exclusively devoted to the antituberculosis work of Red Cross societies during and after the war. Besides giving space to the activities of each of three French Red Cross societies (Société de secours aux blessés militaires, Union des Femmes de France, and Association des Dames françaises), the *Bulletin* gives prominence to an article by Professor Letulle on the rôle of the American Red Cross in the campaign against tuberculosis in France during the war.

LONDON

(From Our Regular Correspondent)

May 29, 1920.

A Systematized Medical Service: A Revolutionary Scheme

A scheme which will revolutionize medical practice in this country and is certain to be adopted, whether in a modified form or not, has been officially brought forward. It is even more revolutionary than the national insurance act, which simply extended contract practice from a section of the working classes to the whole, making provision for illness compulsory instead of optional, and subsidizing the system. The new scheme affects the whole of medical practice and aims at bringing within the reach of every patient all the advances of science and the expensive and complicated equipment necessary for their application.

When the ministry of health was formed last year, provision was made for a consultative council, consisting of physicians, to advise the minister on medical affairs. He invited it to consider the problem of a systematized medical service. The council has now presented its report, which begins with a description of the failure of the present organization of medicine to bring the advantages of medical science within reach of the people. Medical treatment, while becoming more effective, tends to become more complex. This tendency is exemplified in the modern handling of such complaints as appendicitis and tuberculosis. As the complexity of treatment becomes greater, it grows increasingly difficult for the individual practitioner to administer the full range of treatment, requiring, as it does, access to such resources as those of bacteriology, biochemistry, radiology and electrotherapeutics, while the number of patients who can afford to pay for it diminishes. Public opinion, again, appreciates more and more that the home does not always afford the best hygienic conditions for recovery from serious illness. Any scheme of medical service must be open, though not necessarily free, to all classes of the community; it must be such as can grow and expand and adapt itself to varying local conditions, and in each locality it must comprise and provide for all the medical services, preventive and curative, necessary to the health of the people, all these agencies being brought together in close coordination under a single health authority for each area.

At the center of the medical service of the country lies the treatment which the physician gives to his patient, either at his own office or at the patient's house. This domiciliary medical service should continue, the physician attending his patients as heretofore, either at their own homes or at his office, and carrying out there such treatment as falls within his competence. All domiciliary service would, however, be brought into relation with a "primary health center" which would serve as the rallying point of all the medical services, preventive and curative, of the district.

There would be, at the primary health center, wards of varying sizes and for varying purposes, including provision for midwifery, an operating room, a roetgenography room, a laboratory for simple investigations, a dispensary, medical

baths, and a common room which would serve as a meeting place for the physicians of the district and for the storage of clinical records on an agreed and standardized basis. There would also be accommodation for communal and preventive services, such as those for prenatal care, child welfare, medical inspection and treatment of schoolchildren, physical culture, and the examination of suspected cases of tuberculosis. So far as midwives and nurses are not available in particular districts under other arrangements, their services could be provided from a center. A dental clinic with a staff of visiting dental surgeons would be another important branch of the equipment.

These primary health centers, one of which should ultimately be found in every convenient center of population, should be staffed by the physicians of the district, patients who visited them or were accommodated in them retaining the services of their own physician. The physician would be able to arrange for the transference of a patient to the primary health center where, retaining the patient still under his own care and control, he would be able to continue the treatment under more favorable circumstances and with a readier access to the resources of modern medical science than are afforded in the office or are possible within the patient's own home. The primary health center would provide the patient (on the terms described below) with food, nursing and all equipment for efficient treatment, but not with medical attendance, which would be paid for either by the patient himself (if a private patient) or through some method of insurance or by the local health authority. While the primary health center thus provided the physician with means not now generally available of offering his patient what may be described as "hospital treatment," while still keeping him under his own control, it would also serve the physician as a center of professional life, bringing him into daily contact with the other physicians of his district, and occasional contact with the consultants and specialists who would attend at fixed intervals from the "secondary health centers" with which each group of primary centers would be brought into relation.

The "secondary health centers" would be situated in a town where an adequate equipment would be possible and an efficient staff of consultants and specialists could be assembled. Each secondary health center would be within access of all the primary health centers in the area. For many secondary centers the nucleus of organization would be found in existing hospitals. Like the primary health centers, the secondary centers would bring together into one organization agencies both of preventive and curative medicine, though in the secondary center each agency would be of a more specialized character. On the curative side, for example, the services of the secondary health centers would be mainly of a consultative type. They would receive cases referred to them by the primary centers either on account of difficulties in diagnosis or because in the diagnosis or treatment of such cases a highly specialized equipment was necessary. Secondary health centers would, in fact, need a complete hospital equipment.

Patients referred for consultation or treatment from the primary health centers would attend at the outpatient clinics of the secondary center or would occupy inpatient beds. The medical staff of the secondary center would be responsible for the treatment of these patients, but physicians would have every opportunity to keep in touch with their patients while attending the center and to resume supervision over them on discharge. The duties of consultants attached to secondary centers would consist of regular attendance at fixed times in their outpatient clinics where they would see cases referred to them; periodic visits to primary health centers in the district allotted to them, and special visits of emergency to primary health centers and, in certain circumstances, to the homes within their areas, always in consultation with the physician. The consultants would be part-time officers and would be paid on a time basis, with extra fees for special visits. Where it is geographically possible, every secondary health center should be brought into relationship with the teaching hospital. The teaching hospital of the district would be found in some large city, and to it would go cases of unusual difficulty from secondary and primary health centers, which would in turn be permeated by the academic influence and the spirit of inquiry and progress associated with a teaching hospital. While preventive services must of necessity be publicly provided, the provision of curative services free of charge at the health centers would impose a heavy burden on public funds. In the public wards of the primary and secondary health centers, standard charges should be made for treatment, though these charges might vary in different parts of the country, and they could only as a rule be a contribution to the cost of treatment, which is often in its entirety beyond the means of many citizens. Private and self-supporting wards should be a part of the provision at the health centers, though the essential services in the public and private wards would be identical.

In order to administer the scheme in each district, the council glances at the need for a new type of local health authority to bring about unity of local control of all health services, curative and preventive. On this body the council asks for due representation of the medical profession, and is of opinion that the authority should in each case be assisted by a local medical advisory council.

On the subject of a state medical service, it says: "The alternative of a whole-time salaried service for all doctors has received our careful consideration, and the council holds that by its adoption the public would be serious losers. No doubt laboratory workers and medical administrators who do not come in personal contact with the sick can with advantage be paid entirely by salary. The clinical worker, however, requires knowledge not only of the disease but of the patient: his work is more individual, and if he is to win the confidence so vital to the treatment of illness, there must be a basis not only of sound knowledge but of personal harmony. The voluntary character of the association between doctor and patient stimulates in the former the desire to excel both in skill and helpfulness. In no calling is there such a gap between perfunctory routine and the best endeavor, and the latter would not be obtained under a whole-time state salaried service, which would tend, by its machinery, to discourage initiative, to diminish the sense of responsibility, and to encourage mediocrity."

VIENNA

(From Our Regular Correspondent)

May 28, 1920.

Work of the American Red Cross

In April, the American Red Cross took up its welcome work in Vienna, and its beneficial effects are now felt in all hospitals and charitable institutions. The chief aim of the work is to assist the hospitals and convalescent homes in their special efforts, by distribution of the necessary articles of food and nursing supplies. A committee of Vienna physicians is cooperating with the Red Cross in this respect. Infants and nursing mothers are receiving special attention by distributions through the Society of Friends, which depends chiefly on the resources of the Red Cross for its humanitarian work. A large number of charitable institutions which direct their attention to the deplorable conditions of the so-called middle classes (the latter are now really worse off), receive valuable gifts in the form of food

and clothing. It is a good idea that articles of clothing, garments, linens, bed-clothes, etc., show a small label, bearing the words "Compliments, American Red Cross," with the name of the district and the town whence they are sent. Major Davis, in charge of the Department of Vienna, lays special stress on the fact that the American officers connected with the Red Cross do not interfere with commercial, political or religious affairs of the communities in which they are working. Among the most valuable articles provided by the American Red Cross are medicines and drugs which are not obtainable here. Quinin, opium, morphin, cocain and camphor are real rarities. The price for morphin, for instance, rose to 800,000 Kroner (over $4,000) per kilogram. Surgical instruments and objects made chiefly of glass or rubber, which are needed very badly, are available at the Red Cross storehouses in great quantities; the same is true of clothing for hospital patients, shirts, gowns, robes, shoes and the like. Furthermore, 4,000 cases of emergency rations of the American Army, including cocoa, condensed milk, preserved meat, salt, sugar, tea and matches are in storage awaiting distribution. The funds and stocks of the organization are being constantly replenished, so that the activities appear to have a permanent character. This work will prove not only a most valuable help in distress, but it will impress the public with the earnestness and the humane feelings of the American people as a whole.

Dearth of Foreign Scientific Literature

As has been pointed out previously, the scientific institutes of Vienna are very much handicapped in their work by the deplorable lack of books and periodicals published abroad since the outbreak of the war. Because of the exchange rates, the institutions with their insignificant funds cannot purchase foreign journals or books, since, for instance, the annual subscription of a single leading American, English or French medical periodical consumes from 20 to 25 per per cent. of the total sum available. Appeals for gifts of periodicals have been made by the University of Vienna to different foreign institutes, but to date the results are very meager. Another subject of distressing nature is the constant rise in the cost of printing and of paper, whereby the medical press of the country is seriously hampered, with the imminent danger that some of our most distinguished medical periodicals will be forced to suspend publication. Naturally, not only the students in the institutes are materially interested in the matter, but also the general practitioners. It is difficult to see how they are going to keep abreast with the scientific work of the world, and how they will succeed in publishing the results of their own investigations, if the chief means of international communication are suppressed.

The Campaign Against Prostitution and Venereal Diseases

From time to time the daily papers publish items about the fight being waged by the police sanitation committee on prostitution. However, the problem is surrounded by so many difficulties, that public discussion of this serious matter is not readily countenanced. The facts underlying the problem are as follows: It is clearly understood that the great war caused an enormous increase in the incidence of venereal diseases, while the morals of the general public have been quite lax. In all large cities of the continent, public and clandestine prostitution has been promoted to a most deplorable degree by the accumulation of soldiers, but perhaps nowhere so much as in Vienna. Here bad economic conditions have contributed with other factors to deprave the moral standard of certain classes of women. In former times the "street-walker" or the occasional clandestine prostitute hailed chiefly from such classes as waiters, unemployed housemaids and factory girls, while today, these form only a small percentage of the grand total. Now shop girls, clerks, typewriters, and even daughters and wives from reputable families become victims of the economic misery. Not so much the desire for luxury and pleasure as sheer poverty and hunger drive them to the road of shame. The figures obtained by the police are simply appalling. The police, as a routine matter, make surprise visits to small hotels, hostelries, bars and similar places, and cause all women found there without good reasons to be examined. In 1919, 7,000 women and girls were arrested under suspicion of clandestine prostitution. Of these over 1,700 suffered from manifest venereal disease, and 2,400 were dealt with by a special department of the police. Among the latter, 800 were between 18 and 21 years of age, more than 40 per cent. being venereally infected. An additional 380 were under 18 years of age, and of these 50 per cent. were diseased. Even worse conditions were found in the "surprise raids" conducted this year. Up to April 1, the police department had ordered the examination of over 800 women and girls found in suspicious surroundings. Ninety girls were between 14 and 18 years old, 60 per cent. of them diseased, and nearly 40 per cent. of all those examined were found infected. Naturally this represents only a percentage of those who actually lead such a life. The counterpart is to be found in the outpatient departments of our dermatologic clinics, where the number of men suffering from venereal diseases is constantly increasing. The government has instituted a number of so-called evening ambulatory clinics in all districts of the city, chiefly on the outskirts where the working classes are congregated. Altogether about twenty-five such ambulatory clinics are now functioning, conducted by duly qualified specialists in venereal diseases. Here, investigations are being made as to the source of infection, and it appears that about 70 per cent. of all men cohabiting with prostitutes become infected in spite of all prohibitive and prophylactic measures. Therefore the police have recommended the adoption of a law enforcing the examination, and, where necessary, the detention and treatment of the male partner in all instances of prostitution. For what does it avail to detain the women while the men are permitted to disseminate venereal diseases ad libitum? The idea has been commented on favorably by medical experts and by the government, and in the new health act, now under consideration, this point will be earnestly dealt with. It is proposed to make the wilful transmission of venereal diseases, irrespective of the sex of the culprit, a punishable offense and to enforce compulsory treatment of venereal diseases.

Marriages

CLARENCE J. MANLY, Colonel, M. C., U. S. Army, to Mrs. Mabel Graham Billingslea of Westminster, Md., at Baltimore, June 5.

WILLIAM PARKER HERBST, Rochester, Minn., to Miss Catherine Arnold of Chicago, at Lake City, Minn., June 12.

JULIUS ASHER MILLER, New York City, to Miss Pearle M. Lebowich of Dixon, Ill., May 28.

LEWIS SAMUEL BOOTH to Miss Elizabeth Willard Stead, both of New York City, June 1.

STEWART ELLSWORTH MANDEVILLE to Miss Fern Anderson, both of New York City, May 4.

LEE HOLLISTER FERGUSON to Miss Margaret A. Knapp, both of New York City, May 20.

EDWARD T. JUCHHOFF, Chicago, to Mrs. Lois E. Masters of Jacksonville, Ill., April 22.

MAX JOHN SCHROEDER to Miss Shirley Goldberg, both of New York City, June 12.

Deaths

Joseph Willis Houston, Lancaster, Pa.; Jefferson Medical College, 1857; aged 86; a member of the Medical Society of the State of Pennsylvania, assistant surgeon of Pennsylvania Volunteers during the Civil War; professor of natural sciences at Lincoln University for six years, and dean of the faculty of the medical department; surgeon of the Maryland Division of the Pennsylvania system for fifteen years; died, June 5.

Edward Herman Miller Sell, New York; Bellevue Hospital Medical College, 1866; aged 87; one of the seven organizers of the New York Academy of Medicine, and the sole survivor; editor of the *Physician and Pharmacist* from 1869 to 1880; a fellow and once vice president and treasurer of the American Academy of Medicine, who made special studies regarding liquor and drug addiction; died, June 6.

Alfred Harris Kelly, Louisville, Ky.; Louisville, Ky., Medical College 1895; aged 46; Captain, M. C., U. S. Army, and discharged on account of physical disability August 21, 1918; formerly coroner of Jefferson County, and professor of chemistry and toxicology at the University of Louisville; for more than a year medical director of Hazelwood Sanatorium; died, May 28, from cerebral hemorrhage.

Carl John Ringnell ✠ Minneapolis; University of Minnesota, Minneapolis, 1891; aged 55; a member and executive secretary of the State Board of Medical Examiners and a leader of the movement which resulted in the enactment of an anti fee-splitting law; one of the founders of the Swedish Hospital, Minneapolis; at one time deputy coroner of the city; died, June 2.

Henry James Millard, North Adams, Mass.; Berkshire Medical College, Pittsfield, Mass., 1864; aged 84; a member of the Massachusetts Medical Society; a member of the staff of the North Adams City Hospital; assistant surgeon of the Thirty-Fourth Massachusetts Volunteer Infantry during the Civil War; died, May 30, from heart disease.

James Sylvanus Sprague, Belleville, Ont.; Victoria University, Cobourg, Ont., 1869; Trinity Medical College, Toronto, 1890; aged 75; for several years examiner on materia medica and therapeutics of the Medical Council of Ontario, and once a member of the State Board of Medical Examiners of Iowa; died, April 23.

Isaac A. Shirley, Winchester, Ky.; University of Louisville, Ky., 1875; Bellevue Hospital Medical College, 1879; aged 71; a member and president in 1909 of the Kentucky State Medical Association; formerly vice president and president of the Clarke County Medical Society; a member of the State Board of Health; died, June 5.

Edward Dennis McGiverin, Jersey City, N. J.; University and Bellevue Hospital Medical College, 1909; aged 34; Lieutenant, M. C., U. S. Army, during the World War, and resigned on account of poor health; while on his way to California for his health, died at the Elk's Club, Salt Lake City, June 7.

William S. Jones ✠ Camden, N. J.; Jefferson Medical College, 1878; aged 62; for fourteen years a member of the faculty of his alma mater; superintendent of the Old Soldiers Home, Vineland, N. J., and State Medical Examiner of Institutions; died, June 8, from heart disease.

John Harrell Maxwell, Newton, Ill.; Medical College of Ohio, Cincinnati, 1878; aged 85; hospital steward of the Thirty-Eighth Illinois Volunteer Infantry during the Civil War; one of the founders of the Jasper County Medical Society; died, April 3, from cerebral hemorrhage.

Antonio Villanicencio, Taal, Batangas, P. I.; Santo Tomas University, Manila, P. I., 1915; a member of the Philippine Islands Medical Society, who was taking a postgraduate course in New York; died in the Post-Graduate Hospital, New York, February 6, from lobar pneumonia.

Burl Samuel Hood, Bond, Miss.; University of Nashville, 1906; aged 39; a member of the Mississippi State Medical Association; lieutenant, M. C., U. S. Army, with service in France, and discharged July 3, 1919; was shot and instantly killed at the home of a patient, June 3.

Ferdinand Siegel ✠ Brooklyn; University of the City of New York, 1890; aged 53; chief of the general medical staff and associate pediatrician in Bedford Maternity Hospital; died, May 25, from a nervous breakdown.

✠ Indicates "Fellow" of the American Medical Association.

Francis Joseph Adams ✠ Great Falls, Mont.; Georgetown University, Washington, D. C., 1881; aged 60; a specialist in surgery; while returning in his automobile from Belt to Great Falls, Mont., June 2, was killed by the overturning of his car.

Harry Dushane Todd ✠ Akron, Ohio; Eclectic Medical Institute, Cincinnati, 1898; aged 43; police surgeon of Akron for fifteen years; visiting physician to the Akron City Hospital; died, May 25, from heart disease.

Richard William Muller ✠ New York; University of the City of New York, 1879; aged 69; a specialist in dermatology; a member of the New York Academy of Medicine; died, June 3, from heart disease.

Nathaniel F. Lindsay, Robinson, Ill.; University of Louisville, Ky., 1878; aged 70; a member of the Illinois State Medical Society; died, March 26, from carcinoma of the pancreas.

William Henry Woodbury, Buffalo; University of Buffalo, 1888; aged 56; a member of the Medical Society of the State of New York; a specialist in diseases of the lungs; died, May 8.

Kesey Shindle Marlin, Dakota, Ill.; Pennsylvania Medical College, Philadelphia, 1854; aged 89; surgeon of U. S. Volunteers during the Civil War; died, March 2, from senile debility.

Alvah M. Davis ✠ Philadelphia; University of Pennsylvania, Philadelphia, 1892; aged 49; assistant to the nose, throat and ear clinic of Germantown Hospital; died, May 14.

Edith Winifred Stewart ✠ Hume, N. Y.; University of Buffalo, 1898; aged 45; died in the Warsaw (N. Y.) Hospital, May 16, three weeks after an operation for appendicitis.

George E. Powell, LaCrosse, Wis.; College of Physicians and Surgeons, Keokuk, Iowa, 1884; aged 71; a noted scout on the plains during the Indian uprisings; died, May 17.

Guy Burrell Stall, Detroit; Detroit Homeopathic College, 1904; aged 39; a member of the Michigan State Medical Society; died, May 17, after an operation for a carbuncle.

Isham Griffin Wilson, Demopolis, Ala.; Tulane University of Louisiana, New Orleans, 1868; aged 76; died at the home of his niece in Selma, Ala., May 17, from heart disease.

William Ardrey Kellogg, Fort Adams, Miss.; Jefferson Medical College, 1897; aged 47; is reported to have been accidentally burned to death in his room, May 17.

Simon D. Shive, Bannerville, Pa.; Baltimore Medical College, 1882; aged 66; a member of the Medical Society of the State of Pennsylvania; died, March 12.

Charles O'Reilly, Toronto, Ont.; McGill University, Montreal, 1867; aged 73; for thirty years superintendent of the Toronto General Hospital; died, May 3.

Wyndon Hewitt Davis, Libertyville, Iowa; University of Iowa, Iowa City, 1920; an intern in Harper Hospital, Detroit; died in that institution, about May 19.

Joseph R. Baker, Sanders, Ky.; University of Louisville, Ky., 1908; aged 43; died in the Jewish Hospital, Louisville, May 11, after a surgical operation.

Harry Abram Cosler, Osborn, Ohio; Ohio Medical University, Columbus, 1902; aged 47; a member of the Ohio State Medical Association; died, May 13.

Clyde H. Duncan, Fairmont, W. Va.; Chicago Homeopathic Medical College, 1894; aged 47; died in the McMillan Sanitarium, Columbus, Ohio, May 12.

Samuel F. Hazlehurst, Colorado Springs, Colo.; University of Pennsylvania, Philadelphia, 1876; died in a hospital in Colorado Springs, May 13.

O. L. Kilborn, Chengtu, China; Queen's University, Kingston, Ont., 1889; a medical missionary for twenty-nine years; died in China, about April 20.

Calvin E. Parker, Los Angeles; Missouri Medical College, St. Louis, 1877; formerly a practitioner of Philo and Champaign, Ill.; died recently.

James Thomas Growdon, Akron, Ohio; Kentucky School of Medicine, Louisville, 1894; aged 52; died, May 9, from the effects of rheumatism.

J. Thompson Hume, St. Petersburg, Fla.; College of Physicians and Surgeons, Baltimore, 1887; aged 64; died, May 15.

William M. Bright, Hickman, Ky.; University of Nashville, Tenn., 1869; aged 73; died, May 11, from heart disease.

Anonymous Earl Hardin ✠ Fort Smith, Ark.; Louisville (Ky.) Medical College, 1875; aged 72; died, May 14.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE FRAUD ON THE PUBLIC AND ON THE PROFESSION

FORMITOL TABLETS, II

Report of the Council on Pharmacy and Chemistry

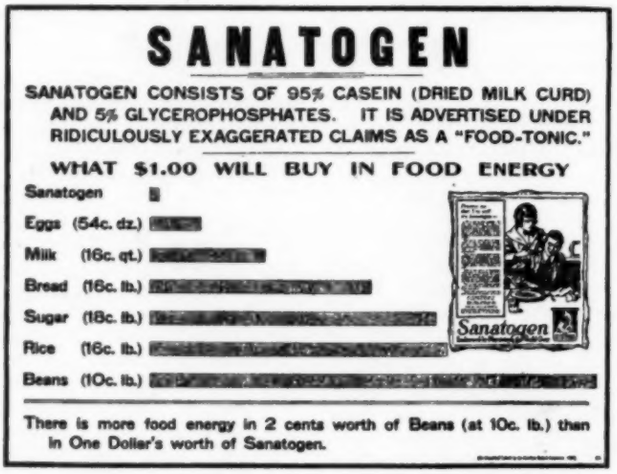
The Council has authorized publication of the following supplementary report on Formitol Tablets.

W. A. PUCKNER, Secretary.

In the Council report (THE JOURNAL A. M. A., Oct. 4, 1919, p. 1077) on the ineffectiveness of lozenges claimed either to contain formaldehyd or to liberate formaldehyd in the mouth, the composition of Formitol Tablets of the E. L. Patch Co. was briefly discussed in the following terms:

> "The A. M. A. Chemical Laboratory reported that Formitol Tablets contained formaldehyd (or paraformaldehyd), an ammonium compound, and some hexamethylenamin. It is probable that the formaldehyd (or paraformaldehyd) was produced by the decomposition of hexamethylenamin originally present in the tablets but decomposed by long contact with the acid."

At the time this report was published, the label and the advertising matter contained but vague and indefinite statements with regard to the composition of Formitol tablets. In the October, 1919, issue of *Patchwork*, the house organ of the E. L. Patch Co., it was denied that these tablets contain hexamethylenamin since none had ever been used in their manufacture. It was also claimed that the company had a "printed sheet giving the formula of these tablets."


SANATOGEN
SANATOGEN CONSISTS OF 95% CASEIN (DRIED MILK CURD) AND 5% GLYCEROPHOSPHATES. IT IS ADVERTISED UNDER RIDICULOUSLY EXAGGERATED CLAIMS AS A "FOOD-TONIC."
WHAT $1.00 WILL BUY IN FOOD ENERGY
Sanatogen
Eggs (54c. dz.)
Milk (16c. qt.)
Bread (16c. lb.)
Sugar (18c. lb.)
Rice (16c. lb.)
Beans (10c. lb.)
Sanatogen
There is more food energy in 2 cents worth of Beans (at 10c. lb.) than in One Dollar's worth of Sanatogen.

Miniature reproduction of one of the educational posters prepared by the Propaganda Department of THE JOURNAL. The originals measure 22 by 28 inches.

The Council advised the E. L. Patch Co. that it desires to publish only facts about the products which it examines and that if the report on Formitol Tablets was inaccurate in any way the Council would want to correct any error it might have unintentionally made. As the Formitol advertising in the files of the Council contained no information as to the composition of the tablets, the firm was also requested to send the printed sheet giving the "formula."

When this printed "formula" came it was found to be a sheet used by the E. L. Patch Co. for the purpose of giving its salesmen information regarding Formitol tablets, to be passed on to the physician. This printed sheet conveyed the information that Formitol Tablets contain ammonium chlorid, benzoic acid, citric acid, guaiac, hyoscyamus, menthol, paraformaldehyd and tannic acid, but it gave no information in regard to the amount of any of the ingredients except that it declared that each tablet represents the equivalent of 10 minims of a 1 per cent. formaldehyd solution.

Because of the nonquantitative and therefore meaningless printed "formula" and because, also, of its complexity, it was thought desirable to make a more complete analysis of Formitol Tablets. Experience has shown that frequently the real formula of a thing is quite different from the alleged formula published by the manufacturer. The details of the laboratory's later analysis will appear in the Annual Reports of the Chemical Laboratory or may be had on request.

The result of the laboratory's additional experimental work, especially when taken in connection with investigations made elsewhere on the interaction of formaldehyd and ammonium chlorid justifies the conclusion that Formitol Tablets do contain some hexamethylenamin, even though the amount may be very small. As the E. L. Patch Co. declare that no hexamethylenamin is put into Formitol Tablets the conclusion drawn in the Council's original report to the effect that the formaldehyd probably was formed by the decomposition of hexamethylenamin was evidently an error. The hexamethylenamin present is doubtless produced by the action of the paraformaldehyd on the ammonium chlorid present.

The analysis also showed that more than 78 per cent. of the weight of Formitol Tablets was made up of sugars and about 16.5 per cent. was starch and other material, some of which was talcum or similar material. This means that about 94 per cent. of the total weight of the tablets is sugar and starch none of which are mentioned in the printed "formula." The significance of this is apparent when it is considered that there are eight ingredients listed in the "formula" for which therapeutic effects are claimed. Since a tablet weighs about 13.5 grains, the combined weight of all the claimed active ingredients is less than 1 grain per tablet!

The amount of ammonium chlorid found, as indicated by the total nitrogen, was not more than 1.0 per cent. or about ⅛ grain per tablet. The amount of benzoic acid found was 0.34 per cent. or 1/25 grain per tablet. Yet these two drugs are said to exert their peculiar expectorant action. (The U. S. P. lozenge of ammonium chlorid contains 1½ grains ammonium chlorid or twelve times the amount of this drug in a Formitol tablet.)

The tannic acid contained in the tablets could not be determined with accuracy but it was much less than 1 per cent. (or ⅛ grain per tablet) yet it is said to add valuable astringent qualities to Formitol Tablets! (The U. S. P. lozenge of tannic acid contains 1 grain of tannic acid.)

The quantity of guaiac (as resin) is but a fraction of 1 per cent. Yet it is said to impart to Formitol tablets "stimulant resolvent" properties and it is intimated that there is sufficient to be of value in "cases of abscess of the throat and inflammation of the tissues."

The total acidity indicates the presence of about 2 per cent. of citric acid or ¼ grain per tablet. Yet this amount is said to be "antiseptic" and "aids in the general results."

While the presence of the drug hyoscyamus (henbane) was not positively identified by microscopic examination, alkaloids were present.

The manufacturers claim that the tablets contain menthol yet only a suggestion of menthol could be obtained from the odor. However the odor of methyl salicylate—a constituent *not* declared in the "formula"—predominated throughout the operations of analysis.

Formitol tablets furnish a good illustration of some well established but often ignored truths:

1. "Formulas" that are nonquantitative are valueless or worse than valueless.

2. The fact that a manufacturer puts certain drugs in a mixture, is no proof that these drugs are there when the mixture reaches the patient. The physician must be assured that they are there when he prescribes them.

3. Complex mixtures should be avoided. It is absurd to expect, as is claimed in the case of Formitol Tablets, anodyne, antiseptic, astringent, expectorant, and resolvent action all at the same time.

Correspondence

MEASUREMENT OF RADIUM

To the Editor:—In the routine testing of hermetically sealed radium preparations, the ionization produced in a given ionization chamber by the penetrating gamma radiation proceeding from the preparation is compared with that produced under the same conditions by the similar radiation from a standard containing a known amount of radium. Mesothorium preparations also emit a penetrating gamma radiation, and consequently by a single comparison with the radium standard in the manner just indicated there is no means for distinguishing such a preparation from one containing only radium and its derivatives.

It is for this reason that the usual radium certificate issued by the National Bureau of Standards contains no statement concerning the actual amount of radium contained in the preparation, but merely a statement of its equivalent radium content. The primary object of the measurement of such preparations by the bureau is to insure the purchaser against any serious error in the radioactive measurement of the preparation.

The carnotites, from which the domestic radium is produced, are known to contain only a negligible amount of mesothorium. Tests made on radium produced from such ore gave no evidence of the presence of mesothorium, and were such as to indicate that the mesothorium present cannot exceed 0.2 per cent. of the radium content of the material. Consequently, it is quite safe to assume that the radium produced from these deposits will be practically free from mesothorium unless the latter product is deliberately added. This is a matter over which the producer has control and concerning which he can speak with confidence. It is customary for the domestic producers of radium to guarantee that their product is practically free from mesothorium, and such a guarantee might well be requested by the purchaser.

Although the examination of a hermetically sealed radium preparation for the presence of mesothorium forms no part of the routine measurement of such materials by the bureau, such examination will be made when requested under conditions that justify the work. These examinations are laborious, require the opening of the preparation and the removal of some of the salt, and involve the risk of a considerable loss of material. As in the case of all tests made by the bureau, the applicant must furnish the material used, assume the risk of loss, and pay a fee commensurate with the labor involved.

On the other hand, even without this examination the purchaser is not left entirely to the mercy of unscrupulous dealers. Repeated gamma ray comparisons, using radiations filtered through different thicknesses of lead, will in general furnish data from which it can be determined whether much of the radiation from the preparation is due to mesothorium. Such tests on sealed specimens are deliberately made from time to time, and similar but less complete data are incidentally obtained from many specimens in the routine course of the testing. In no case has such test revealed to us the presence of mesothorium in any preparation that has been submitted to this bureau as one free from mesothorium; but few imported preparations have been so tested.

Another check on the possible presence of a significant amount of mesothorium in a radium preparation is afforded by its remeasurement. If the preparation contains a significant amount of mesothorium, then a second measurement made several months after the first will reveal:

1. A growth in the intensity of its radiation if all radiothorium had been removed from the material shortly before the first measurement.

2. Little or no growth if the radiothorium was last removed two or three years before.

3. A decrease of the radiation if the radiothorium had not been removed for over three years.

It is evident that unless the two measurements are very specially related to the age of the contained mesothorium, they will reveal its presence.

In the course of its work, the bureau has to its knowledge remeasured forty-seven radium preparations after intervals varying from two weeks to four years. Preparations from three domestic producers are included in the list. Some of these preparations were resubmitted by their producers, others by their purchasers. For fifteen of the preparations, the interval between these measurements exceeded six months. In no case did the difference between the two measurements exceed the sum of the allowable uncertainties of the two measurements. Excepting a single case in which the initial determination was known to have an unusually low precision, a difference as great as 0.9 per cent. was found in only one instance. The average difference was 0.34 per cent. The second measurement usually, but not always, exceeded the first. This probably results from the fact that in many cases the radium had not fully attained its equilibrium at the time of the first measurement. Even thirty days after the radium preparation is sealed, it is 0.45 per cent. short of its maximum gamma radiation.

Whence it is seen that as yet we have found no indication that any hermetically sealed preparation offered by a domestic producer as a radium preparation contains an appreciable amount of mesothorium. Very few such specimens offered by small dealers, jobbers or importers of radioactive material have been submitted to the bureau. Consequently we are at present not prepared to express an opinion concerning the material obtained from such sources.

S. W. STRATTON, PH.D., Washington, D. C.
Director, Bureau of Standards.

A NEGLECTED AID IN DIAGNOSIS AND PROGNOSIS—THE OPHTHALMOSCOPE

To the Editor:—My object in writing is to promote the more frequent use by the general practitioner of an instrument that is far too little used, considering its value to the medical profession, namely, the ophthalmoscope. The ophthalmoscope is an aid to the diagnosis not only of diseases of the eye itself but also of general diseases. And yet it is deplorable to see what little use is made of this aid by the majority of physicians. In looking over case reports, how often do we see the records of the findings of every test known to science, except the easiest of all tests, the ophthalmoscope? Since easily manipulated electric instruments are now obtainable, a practitioner is lax indeed who does not own one along with his blood pressure apparatus. The most surprising thing of all is that the large insurance companies have not before this insisted on it as part of the examination.

On the other hand, the chief may look at an eye-ground and say nonchalantly to the resident, "There is an interesting case of so-and-so," handing the ophthalmoscope to the resident, who, looking into the eye, does not at once see the condition, but is ashamed to admit it, says that he does, and thereby learns nothing. Thus he goes all through his service, rarely seeing an eye-ground, and later, never even attempting to look at one, as it seems too intricate for him to master. Of course the only solution of this is closer cooperation in the eye department, and the only way in which this can be brought about is for the ophthalmologist to show enough interest in the intern so that he will be glad to learn, and, once having gained the knowledge, will be more likely to follow it up in later years.

By this means the whole interior of the eye is accessible; blood vessels and nerves, which in other parts of the body are exposed only by surgery, are here plainly seen in their normal positions.

From a diagnostic and prognostic standpoint it is the only reliable instrument that we have. By the use of the sphygmomanometer one can tell that the pressure is high at that particular time, but that does not show us whether it is transient or permanent. With the ophthalmoscope, when one finds the small, hard, tortuous or ruptured vessel, one knows definitely that it is a permanent affair, and what the ultimate outlook is. If physicians would use it more generally as a part of the routine examination, many vague and indefinite cases would have their diagnosis established earlier.

L. G. REDDING, M.D., Scranton, Pa.

GAIN IN WEIGHT IN SOLDIERS

To the Editor:—Many exaggerated statements have been made as to the gain in weight soldiers have acquired during the war. So says the Surgeon-General of the Army (THE JOURNAL, Feb 21, 1920, p. 499), and he adds that at the present time no correct statement can be made.

The following facts were observed on the personnel of Base Hospital 76, with which we were mobilized at Camp Devens in July, 1918 (first weighing), and with which we served in Vichy, Allier, France (second weighing, six months later). During the first month in the American Expeditionary Forces, 42 per cent. of our unit had so-called influenza, but otherwise suffered comparatively few food difficulties or other hardships, and may therefore be presumed to show as favorable a gain as any command.

Gain in weight was seen in 194 men, or 84 per cent. of the series of the 229 subjects studied; and in these the gain averaged 8 per cent., with a maximum of 25 per cent. above the weight at enlistment. Loss in weight was noted in 10 per cent. of the series and in these the loss averaged 5 per cent. with a maximum of 18 per cent. below the weight at Camp Devens. Constant weight was observed in 6 per cent. of the series, whereas in 94 per cent. there was some change. This variation, averaging gains and losses together, was 7 per cent. of the weight at entry into service. Age played no part, that is, gains were no greater nor more frequent among the younger men than among the older. The foregoing conclusions are derived from figures presented but not analyzed elsewhere (Gray, Horace, and Mayall, J. F.: Body Weight in 229 Adults, *Arch. Int. Med.*, to be published).

HORACE GRAY, M.D., Boston, and
F. B. ALLEN, M.D., North Wales, Pa.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

EXAMINATIONS FOR OFFICERS OF MEDICAL DEPARTMENT

To the Editor:—Will it be necessary for a physician who is already in the Medical Reserve Corps to take any further examinaton in order to enter the regular army? A. A. SIZER, M.D., Schuyler, Va.

ANSWER.—Yes. An examination will be held, July 7, 1920, for officers of the Medical Department at the following places:

Northeastern Department, Headquarters, Boston.
General Hospital No. 6, McPherson, Ga.
General Hospital No. 21, Denver.
General Hospital No. 28, Fort Sheridan, Ill.
General Hospital No. 41, Staten Island, N. Y.
Camp Pike, Little Rock, Ark.
Camp Taylor, Louisville, Ky.
Camp Funston, Manhattan, Kan.
Fort Sam Houston, San Antonio, Texas.
Letterman Hospital, San Francisco.
Walter Reed Hospital, Washington, D. C.

All physicians who served as officers of the Medical Department between April 6, 1917, and June 5, 1920, are eligible, and all grades are open within the restrictions of the law.

Applications must be in the War Department on or before June 23. Applications will be considered only from persons who since March 25 have received and replied affirmatively to inquiry from the War Department as to whether or not they desire further consideration given their application in the Regular Army; also to persons who since March 25 submitted Form 739 to the War Department, and all other eligible persons who submit Form 739 at once. Copies of this form may be obtained through the Surgeon-General's Office.

The age limit for all grades is 58 years: 48 to 58 for Colonel; 45 to 58 for Lieutenant-Colonel; 36 to 58 for Major, with no restrictions regarding captain. Appointment and grade will be determined by record of the applicant while in the service. His rank at the time of discharge will probably not be exceeded in the reappointment. The possession of a medical degree will exempt the applicant from the general educational examination, but a professional examination is required on the subjects of medicine, surgery, sanitation and administration.

FORMULA FOR MOUTHWASH

To the Editor:—Please furnish me with a formula for the best mouth wash to be used by patients after tooth extraction and for general mouth hygiene. I desire this for my private practice and for use in my clinic. A. R. W.

ANSWER.—

LIQUID DENTIFRICE

	Gm. or C.c.
Castile soap, dried and granulated	6|00
Benzosulphinid	0|20
Basic fuchsin	0|002
Oil of cassia	0|50
Oil of peppermint	0|50
Oil of cloves	1|00
Alcohol	75|00
Water ... to make	100|00

A few drops added to water to be used as a mouth wash.

It will be noted that, excepting for the volatile oils present, antiseptics and disinfectants are conspicuous by their absence. As is well known, it is impossible to disinfect the mouth. Mere bacteriostatic (germ growth inhibitive) influence can be of value only as long as the agent is present; and the time that one is willing to keep the mouth full of fluid is limited.

The chief virtue of mouth wash preparations lies in their esthetic qualities: their pleasant appearance, odor and taste, which make one use them with a greater degree of pleasure and therefore more faithfully. The formula given yields a pleasant detergent.

METHOD OF SECURING MEDICAL LICENSURE IN LARGE NUMBER OF STATES

To the Editor:—I am about to enter on the practice of medicine but have no definite location in mind. By what method can I secure medical licensure in the largest number of states? Please omit my name. E. M. B.

ANSWER.—1. By taking the examination of the National Board of Medical Examiners you could obtain a certificate now recognized in twenty states. These were named in THE JOURNAL, April 17, 1920, p. 1100. For further information, write to Dr. John S. Rodman, secretary, 1310 Medical Arts Building, Philadelphia.

2. Take your examination in some state—such as Michigan, Indiana or Wisconsin—which has reciprocal registration with thirty or more other states. To secure reciprocal privileges, however, you will need to practice for at least one year in the state granting your original license. Full information is contained in "Laws Regulating the Practice of Medicine," which is published by the American Medical Association. A copy of this book will be forwarded on receipt of 50 cents.

SMALLPOX PITTING UNREMOVABLE

To the Editor:—Is there a remedy for treating the old lesions of the skin caused by smallpox? If so, which is the best?
HONORIO F. DELGADO, M.D., Lima, Peru.

ANSWER.—There is no way of removing the scars (pitting) of smallpox.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, July 13. Chairman, Dr. S. W. Welch, Montgomery.

ARIZONA: Phoenix, July 6-7. Sec., Dr. Ancil Martin, 207 Goodrich Bldg., Phoenix.

CALIFORNIA: San Francisco, June 28-July 1. Sec., Dr. Chas. B. Pinkham, 135 Stockton St., San Francisco.

COLORADO: Denver, July 6. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

CONNECTICUT: Hartford, July 13-14. Sec., Regular Board, Dr. Robert L. Rowley, 49 Pearl St., Hartford.

CONNECTICUT: New Haven, July 13. Sec. Eclectic Board, Dr. James Edwin Hair, 730 State St., Bridgeport. Sec. Homeo. Board, Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DISTRICT OF COLUMBIA: Washington, July 13-15. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

INDIANA: Indianapolis, July 13-15. Sec., Dr. Wm. T. Gott, Crawfordsville.

MAINE: Portland, July 6-7. Sec., Dr. Frank W. Searle, 140 Pine St., Portland.

NEW MEXICO: Santa Fe, July 12-13. Sec., Dr. R. E. McBride, Las Cruces.

NORTH DAKOTA: Grand Forks, July 6-9. Sec., Dr. Geo. M. Williamson, 860 Belmont Ave., Grand Forks.

OKLAHOMA: Oklahoma City, July 13-14. Sec., Dr. James M. Byrum, Mammoth Bldg., Shawnee.

OREGON: Portland, July 6. Sec., Dr. Urling C. Coe, 1208 Stevens Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 6-10. Sec., Dr. Thos. E. Finnegan, State Capitol, Harrisburg.

RHODE ISLAND: Providence, July 1-2. Sec., Dr. Byron U. Richards, State House, Providence.

SOUTH DAKOTA: Deadwood, July 13. Sec., Dr. Park B. Jenkins, Waubay.

UTAH: Salt Lake City, July 5-6. Sec., Dr. G. F. Harding, 405 Templeton Bldg., Salt Lake City.

VERMONT: Burlington, June 29-July 1. Sec., Dr. W. Scott Nay, Underhill.

WASHINGTON: Seattle, July 6-8. Sec., Dr. Wm. M. O'Shea, 305 Old National Bank Bldg., Spokane.

WEST VIRGINIA: Charleston, July 13. Sec., Dr. S. L. Jepson, Masonic Bldg., Charleston.

WISCONSIN: Milwaukee, June 29-July 1. Sec., Dr. John M. Dodd, 220 E. Second St., Ashland.

REPORT OF EIGHTH EXAMINATION OF THE NATIONAL BOARD OF MEDICAL EXAMINERS

The eighth examination of the National Board of Medical Examiners was held in Chicago and St. Louis, Feb. 18-25, 1920. The written examinations were held simultaneously in the two places from 9 a. m. to 1 p. m., and the laboratory and clinical examinations in the afternoons from 2 to 5. The subjects of the examination and the relative value of each were: anatomy, 100; physiology, 75; chemistry, 75; pathology, 75; bacteriology, 50; materia medica, pharmacology, and therapeutics, 75; medicine, 200; surgery, 200; obstetrics and gynecology, 75; hygiene and sanitation, 50; medical jurisprudence, 25. A percentage of 75 was required to pass. Falling below 65 per cent. in two subjects, or below 50 in one subject, constituted a failure.

There were sixty-two applicants who applied for examination. Sixty were found to have the essential preliminary and medical qualifications. Forty-eight appeared for examination, of whom thirty-six passed and twelve failed.

PASSED AT CHICAGO

Name	College	Year of Graduation
Philip Wade Whitely	Rush Medical College	1919
William R. Meeker	Rush Medical College	1919
Franklin P. Schuster	Rush Medical College	1918
S. John Hathaway	University of Minnesota	1919
Warren E. Tupper	Rush Medical College	1919
B. Raymond Weston	Rush Medical College	1917
Eugene F. Traut	Rush Medical College	1918
Chester H. Williams	Rush Medical College	1919
John H. Gernon	Rush Medical College	1919
George H. Miller	University of Pennsylvania	1917
Henry J. Profant	Rush Medical College	1919
Blackburn W. Lowry	Northwestern University Medical College	1919
Norman C. Paine	Rush Medical College	1919
Edward C. Holmblad	Rush Medical College	1919
Richard Torpin	Rush Medical College	1917
Charles J. Eldridge	Rush Medical College	1919
Roger Anderson	Northwestern University Medical College	1918
George J. Mohr	Rush Medical College	1918
Louis J. Petritz	Northwestern University Medical College	1918
David O. Conly	Northwestern University Medical College	1918
George Douglas Brand	Northwestern University Med. College	1917
Paymond C. Thompson	Rush Medical College	1919
Ralph J. Frackelton	University of Michigan	1918
George W. Hogeboom	Rush Medical College	1919
Abraham J. Weinberg	Rush Medical College	1919
David M. Levy	Rush Medical College	1918

FAILED

	University of Illinois	1919
	Northwestern University Medical College	1919
	University of Illinois	1919
	Jefferson Medical College	1919
	University of Minnesota	1918
	University of Nebraska	1919
	Western Reserve Medical College	1917

PASSED AT ST. LOUIS

Anthony B. Day	Washington University Medical School	1919
Martha M. Eliot	Johns Hopkins	1918
Mort B. Pelz	Washington University Medical School	1919
Fred J. Hodges	Washington University Medical School	1919
George R. Herrmann	University of Michigan	1919
Mary Wright	Johns Hopkins	1918
Earl C. Padgett	Washington University Medical School	1918
Edward F. Studer	Rush Medical College	1919
John E. Elmendorf, Jr.	Johns Hopkins	1918
J. P. Caffey	University of Michigan	1919

FAILED

	University of Minnesota	1919
	University of Iowa Medical College	1919
	Rush Medical College	1919
	University of Texas School of Medicine	1919
	University of Iowa Medical College	1919

In the case of candidates from the Rush Medical School, the M.D. certificate is withheld pending the completion of the one year internship. For successful candidates who have not completed their intern year, the board's certificate is withheld pending the completion of that work.

AVERAGES OBTAINED

CHICAGO CANDIDATES

Candidates by Number	Anatomy; Value, 100	Chemistry; Value, 75	Mat. Med., Pharm. and Therapeutics; Value, 75	Obstetrics and Gynecology; Value, 75	Hygiene; Value, 50	Medicine; Value, 200	Surgery; Value, 200	Pathology; Value, 75	Bacteriology; Value, 50	Physiology; Value, 75	Medical Jurisprudence; Value 25	Final Average
1	61	50	84	65	85	61.5	71.2	78.6	75	60	76	678.8
2	80	62.5	88	77	81	69	87	66.6	84	79	80	774.4
3	86	79	84	85	71	82	87	77.3	68	79	92	819.8
4	87	83	88	77	80	84	87.5	86.6	80	71	72	832.3
5	55	75	80	75	84	72	70.7	77.3	76	69	96	726.8
6	68	76.5	72	65	84	73	76.7	76	74	59	68	724.9
7	82	77	83	85	79	85	85.7	90.6	84	70	84	830.1
8	69	69	74	75	86	71	75	75.3	80	70	80	736.6
9	76	81	76	75	76	79	86.2	69.3	82	77	72	787.3
10	72	77.5	78	70	73	60	72	58.6	72	53	72	681.4
11	79	68	72	75	67	58	81.7	73.3	90	72	72	725.3
12	90	80	84	77	80	83	82.5	75.3	72	87	80	819.5
13	73	78	88	86	84	84.8	82.5	82.6	82	92	88	822.6
14	92	80	84	86	84	77	89	54	82	84	96	822.5
15	80	80	80	75	83	85	85.7	86.6	78	81	80	823.5
16	90	70	84	80	86	81	89	85.3	76	82	88	834.0
17	86	84	80	87	64	76	91.7	75.3	76	72	72	808.3
18	68	92	78	84	76	77	86.2	77.3	87	77	68	799.2
19	61	72	78	86	73	86	82.2	75.3	75	82	72	784.5
20	72	80	76	86	85	86.5	87.7	70.6	78	70	72	810.0
21	66	68	78	84	81	86	86.7	77.3	82	76	68	797.5
22	77	50	76	80	73	70.5	78.5	75.3	78	73	76	735.2
23	72	81	78	85	72	87.5	80.2	75.3	74	67	80	790.3
24	88	92	82	82	75	82	85	82.6	80	79	84	833.7
25	76	78	80	87	79	83	82.5	78.6	78	70	68	797.8
26	83	77	74	78	69	81.5	87.7	78.6	78	68	80	796.8
27	84	71	82	86	84	78	88.5	69.3	82	74	92	809.8
28	83	71	60	85	78	74	85.5	76	80	78	72	791.6
29	68	78	72	82	80	82	77.5	60.6	68	70	84	753.5
30	80	83	70	83	77	85	80.7	66	75	82	76	795.1
31	84	80	31	100	78	86	90	68	76	76	72	837.0
32	79	80	77	82	69	71	84	70.6	77	79	72	771.2
33	73	87	88	70	72	79	85.2	66	76	74	72	782.8
Gen'l Aver.	76.9	76.4	79.1	80.1	77.8	78.1	83.3	74.4	78	74.3	78	

ST. LOUIS EXAMINATION

1	84	95	89	82	85	79.5	83.5	81.3	88	88	76	842.3
2	73	73	81	75	83	82.5	85.5	80	83	92	76	808.8
3	75	95	84	80	92	90	87	84	82	89	88	850.3
4	72	69	69	80	85	58	78.2	69.3	64	76	76	707.8
5	72	98	84	90	81	80.5	84.7	86.6	93	82	72	838.5
6	78	97	80.5	75	81	89	88.2	88	91	92	66	850.7
7	74	93	82.5	68	73	77	77	81.3	81	74	66	776.3
8	59	98	78.5	77	76	87	79.7	68	76	83	80	790.3
9	81	80	89	80	80	77	76.7	75.3	83	85	66	793.2
10	73	78	80	72	79	74	69.5	61.3	77	70	68	728
11	78	48	79.2	80	73	62	71.5	60.6	80	63	66	688.5
12	71	62	88.5	78	80	87.5	85	77.3	91	85	72	814
13	70	62	81	80	82	71	83	75.3	75	67	72	751
14	48	60	71.5	77	82	66	74.2	53.3	73	60	72	668
15	69	63	83	75	82	76.5	75	78.3	74	69	68	744.6
Gen'l Aver.	73.1	78	81.3	77.9	80.9	77.1	79.8	74.6	80	78.3	72.2	

ANATOMY

Examiner, Dr. Herbert Harlan, Baltimore. Associate examiners in practical anatomy: In Chicago: Drs. Roy L. Moody, Ruben Strong, S. W. Ransom, Charles F. Swift and B. S. Harvey. In St. Louis: Drs. C. H. Danforth, A. G. Pohlman, R. G. Terry and D. M. Schoemaker.

Written Examination.—1. Describe the ankle-joint, including relations with tendons, vessels and nerves. 2. Describe the pancreas. 3. What are the chief muscles of mastication, and give attachments, action and nerve supply of each. 4. What nerves are most liable to injury in case of the following fractures: surgical neck of the humerus, internal condyle of humerus, clavicle, upper end of fibula, and state probable cause of injury in each case. 5. What is the site of election for ligation of the subclavian artery; reason therefor; and through what arteries is collateral circulation carried on after such ligation?

Oral Examination.—This was conducted with the use of specimens of the brain, osseous system and internal organs, and specially prepared dissection demonstrating the gross anatomy of joints and definite regions of the body; the identification of specimens of histology under the microscope.

CHEMISTRY

Examiner, Dr. Victor C. Vaughan. Associate examiners in laboratory chemistry: In Chicago: Drs. William H. Welker, F. C. Koch, W. D. Sansum and G. Tracy. In St. Louis: Drs. Ralph W. Hoffman and J. L. Bollman.

Written Examination.—(Physics): 1. Explain by drawings and description the structure of a compound microscope. 2. Explain the mechanism and the use of the ophthalmoscope. 3. What are induced electromotive forces, and what are some experimental ways of producing them? How may they be made of value?

(Chemistry): 1. How would you detect wood alcohol in grain alcohol? What chemical change takes place in wood alcohol in the human body? What poison is formed? 2. Give the most successful chemical methods of purifying drinking water. 3. Give the chemical changes that occur in the protein, fat and carbohydrate constituents of food as they pass through the body. 4. Define an amino-acid and give a list of those amino-acids which have been found in protein molecules. 5. What are the xanthin bases? Where are they found? What is their chemistry and their physiology? 6. What deposits may be found in urine and how may they be identified? 7. Give the chemistry of the red blood corpuscle. 8. What are the five food principles? Construct a daily ration.

Laboratory Examination.—Each candidate was given three samples of urine and required to make a qualitative examination of each for sugar. In the specimen containing the largest amount, a quantitative examination was required.

MEDICINE

Examiners, Drs. H. D. Arnold and W. L. Bierring. Associate examiners: In Chicago: Clinical medicine: Drs. Ellis K. Kerr, Charles S. Williamson, C. C. McCulloch, James G. Carr, Frederick Tice, Joseph L. Miller and Joseph A. Capps, Clinical laboratory: Drs. J. J. Moore, B. O. Raulston and Ralph W. Webster. In St. Louis: Drs. George Dock, F. N. Wilson, E. P. Buddy and J. I. Tierney. Clinical laboratory: Drs. Ralph A. Kinsella and W. P. Elmer.

Written Examination.—(Answer ten questions the first seven questions are required; select three from questions eight to twelve): 1. You are called to treat a child of 8 years who has had a sore throat for twenty-four hours. Pulse, 110; temperature, 102.5; respiration, 22. There is moderate inflammation of the pharynx and tonsils, with a few small whitish spots on each tonsil. (*a*) What further investigation would you make for purposes of diagnosis. (*b*) Describe your treatment in detail. 2. A man of 60 years, complaining of intercostal neuralgia, is found to have sugar in the urine. A twenty-four-hour specimen of the urine shows: amount, 1,200 c.c.; specific gravity, 1.029; albumin, faintest possible trace; sugar, 3.45 per cent.; diacetic acid and acetone, absent; sediment negative except for a very rare hyaline cast. His diet for the same day shows 60 gm. protein; 71 gm. fats; 180 gm. carbohydrates; 1,600 calories. (*a*) Comment on the degree of deficiency in the utilization of carbohydrates and the probable severity of his diabetes. (*b*) Outline a program of treatment. 3. (*a*) Describe a typical case of alcoholic cirrhosis of the liver with ascites. (*b*) Treatment. 4. A man, aged 53, has had for six months epigastric pain, usually two or three hours after eating; recently he has vomited occasionally, but has noticed no blood in the vomitus. He has lost weight and strength. The question of cancer of the stomach arises. Comment on the diagnostic aid that may be derived from (*a*) gastric analysis; (*b*) examination of the blood; (*c*) examination of the stools; (*d*) what other methods of examination would aid toward a diagnosis? (*e*) Discuss briefly the question of operation, assuming that the diagnosis of cancer of the stomach has been established to your satisfaction. 5. What physical signs would you expect to find in a patient with a sacculated aneurysm of the ascending arch of the aorta? 6. Differential diagnosis between smallpox and varicella. 7. A man, aged 65, suffers an attack of right-sided hemiplegia with aphasia. Discuss the location and probable nature of the lesion and the prognosis. 8. Tuberculosis of the kidney: (*a*) How may it arise? (*b*) What would you expect to find in the urine? (*c*) What evidence would warrant this diagnosis? (*d*) Treatment. 9. Typhus fever: (*a*) Discuss the etiology. (*b*) Differential diagnosis from typhoid fever. (*c*) This disease was prevalent in the recent war and still exists in certain sections of Europe. What measures should be adopted to prevent its introduction into this country? 10. How would you recognize the development of an empyema in a case of pneumonia? (*b*) Treatment. 11. Diagnosis, prognosis and treatment of paralysis agitans. 12. Discuss the etiology, diagnosis and treatment of Hodgkin's disease.

Clinical Laboratory (one hour).—Each candidate was required to examine specimens of urine with pathologic sediments, specimens of stool and diagnose blood slides.

Clinical Examination.—This was held in the wards of the Cook County Hospital, Chicago, and in the Barnes and St. John's Hospitals, St. Louis, each candidate being assigned to a long case and then quizzed on his findings. Following this the candidate was assigned to short cases representing some well defined condition, as pleural effusion, enlarged heart, large liver, aortic insufficiency, subacute endocarditis, severe anemia, etc.

MATERIA MEDICA AND THERAPEUTICS

Examiners, Dr. W. L. Bierring and Dr. H. D. Arnold. Associate examiners: Pharmacology: In Chicago: Drs. Hugh McGuigan, R. W. Keeton, F. C. Becht, W. G. Lee and A. L. Tatum. In St. Louis: Drs. J. E. Thomas and Herbert S. Gasser.

Written Examination.—1. Describe one method of standardization of digitalis. In a case of heart failure with auricular fibrillation, outline the use of digitalis, giving the preparation, dosage and mode of administration. 2. Given a case of a man, aged 25, with the history of intermittent fever during the last ten days, the blood slide examination revealing the presence of the tertian type of *Plasmodium malariae*, write the directions for the medication indicated, giving the preparation, dosage and mode of administration of the drug used. Discuss the pharmacologic action of the drug in this case. 3. In a case of a girl, aged 14 years, with acute tonsillitis, in which the bacteriologic examination of a throat swab reveals the presence of *Bacillus diphtheriae* (Klebs-Loeffler), outline in detail the specific therapy indicated during the course of the illness. 4. The patient is a man, aged 36, with a macular eruption of the skin, acute lymphadenitis of the cervical, epitrochlear and inguinal lymph nodes and positive (++++) Wassermann blood reaction. Outline in detail the specific medication indicated (including preparation, physical properties, dosage and mode of administration of the drugs used) during the course of treatment until the blood shows a negative Wassermann reaction. 5. Compare the analgesic value of morphin and hydrated chloral. Write a prescription containing potassium bromid and hydrated chloral for hypnotic effect, to be administered in a vehicle to disguise the disagreeable taste of the mixture, giving full directions to the patient and indicatng the dose intended of each drug.

PHARMACOLOGY

1. Demonstration experiment: A dog was prepared and various drugs injected to show effect on respiration, heart rate, and blood pressure. The effects to be interpreted by the candidate with recognition of the drug used. 2. Diagnosis of a number of tracings as to the pharmacologic effect and the character of drug producing it.

PHYSIOLOGY

Examiner, Dr. W. S. Carter. Associate examiners: In Chicago: Drs. J. T. Groat, H. P. Saunders, J. M. D. Olmstead and George P. Dreyer. In St. Louis: Drs. Frank N. Wilson, R. J. Terry and Don R. Joseph.

Written Examination.—(Answer any five questions): 1. (*a*) What is the cause of the rhythmic contractions of the heart? (*b*) Where does the contraction have its origin and how is it conducted to the different parts of the mammalian heart? 2. Describe the normal movements of the stomach and the mechanism controlling the action of the pyloric sphincter. 3. Tell how the excretion of urine may be influenced: (*a*) By changes in the general circulation, and (*b*) By changes in the circulation within the kidney. 4. (*a*) Describe the structural changes which take place in the peripheral end of a nerve after it has been severed and united by primary suture. (*b*) How much time is required for the restoration of function, and what changes take place in the electrical reactions of the muscles supplied by the nerve? 5. What results (*a*) from destruction and (*b*) from the administration of extracts of different parts of the pituitary body? 6. (*a*) State briefly in what ways glycosuria may be produced experimentally in animals. (*b*) Discuss the "sugar tolerance" test or alimentary tolerance for glucose as an index of carbohydrate metabolism in man.

Practical Examination.—Determine the blood pressure in man by the auscultatory method in the recumbent and erect postures, and record the systolic, diastolic, mean and pulse pressure in each case. Explain the effect of the postural change. Explain from tracings furnished the effects produced on respiration, pulse rate and blood pressure by stimulation (1) of the central end of a divided vagus; (2) a mixed spinal nerve. Explain from tracings the effects of applying the Gaskell clamp or the ligature of Stannius to the frog's heart. Take a tracing of the arterial pulse with a sphygmograph. Describe the features of the arterial and venous pulse in tracings furnished. With a muscle preparation arranged, record the minimal and maximal simple contractions; also complete tetanus. Explain, from the blood pressure tracings furnished, the effects of stimulating the distal end of the cut splanchnic nerve; of stimulating the depressor nerve. Demonstrate the "light" and "accommodation" reflexes of the pupil, and explain the purpose of each reaction.

SURGERY

Examiners, Dr. E. Wyllys Andrews and Col. Louis A. LaGarde. Associate examiners: Operative surgery: In Chicago: Drs. D. B. Phemister, G. L. McWhorter, Linn F. McBride, A. H. Montgomery, M. Hanchett, Gatewood, Edmund Andrews, Carl B. Doris. Clinical surgery: Drs. Karl A. Meyer, R. W. Nealy, Kellogg Speed, Frederic Besley, William R. Cubbins and F. G. Dyas. Surgical specialties: Examiners: Eye, Ear, Nose and Throat: Drs Herbert Harlan and David Strickler. Skin: Dr. Isadore Dyer. Associate examiners: In Chicago: Skin: Drs. Edward A. Oliver and T. E. Senear. Ear, nose and throat; Drs. E. K. Findlay, D. J. Holinger, E. V. L. Brown and G. W. Boat. In St. Louis: Operative surgery: Drs. A. O. Fisher, W. E. Leighton and Max W. Myer. Clinical surgery: Drs. Edwin P. Lehman, Barney Brooks and Evarts A. Graham. Surgical specialties: Eye: Drs. E. T. Sensensy, W. E. Shahan, William F. Hardy and Joseph M. Keller. Ear: Drs. H. W. Lyman, J. B. Shapleigh and C. F. Fingsten. Nose and throat: Drs. Greenfield Sluder, William M. C. Bryan and M. F. Arbuckle. Skin: Drs. M. A. Engman and Joseph Grindon.

Written Examination.—(Answer first seven questions; choose three from last five): 1. Indications for decompression of the brain: (*a*) Subtemporal. (*b*) Subtentorial. 2. Discuss the surgical management of toxic goiter. 3. Surgical management of empyema: (*a*) Caused by *Streptococcus hemolyticus*. (*b*) Pneumococcus. 4. Differential diagnosis of chronic obstruction at the pylorus, ileocecal valve and sigmoid flexure. 5. Treatment of gunshot wound of the liver. 6. Give indications for and technic of the operation of cholecystectomy. 7. Discuss chronic ulcer of the stomach from the standpoint of its complications and sequelae. 8. Treatment of compound fracture of both bones of the forearm just above the wrist-joint. 9. Varieties and diagnosis of dislocations of the humerus. 10. Discuss the diagnosis, prognosis and treatment of malignant pustule. 11. Differential diagnosis between shock and internal hemorrhage. 12. Discuss advantages and disadvantages of: (*a*) Open method of administering anesthetics. (*b*) Closed method of administering anesthetics.

Operative Surgery.—Each candidate was given one operation on a dog previously killed by ether from the following list: trephine; tracheotomy; thoracotomy; lateral intestinal anastomosis: etc.

Clinical Surgery.—This was held in the wards of the Cook County Hospital, Chicago, and the City and Barnes Hospital, St. Louis. Each candidate was given at least three cases and these were chosen from the following: fracture of hip; fracture of tibia and fibula; fracture of femur; supracondylar; leg ulcers; abscess of the neck; obstructive jaundice; carcinoma of stomach; carcinoma of rectum; tuberculous peritonitis; empyema, etc.

PATHOLOGY

Examiner, Dr. Louis B. Wilson; associate examiner, Dr. Eugene L. Opie, St. Louis.

Written Examination.—(Answer the first and any other four of the following questions): 1. (*a*) Describe in detail necropsy technic, including methods for the preservation of tissues. (*b*) In how many postmortems have you taken part? (*c*) How many more have you observed? 2. Discuss the pathology of epidemic influenza. 3. Discuss wound healing. 4. Discuss the pathology of chronic interstitial nephritis. 5. Give the distinguishing characteristics, gross and microscopic, of benign and malignant overgrowths of the uterine mucosa in women past the climacteric. 6. Contrast in parallel columns: (*a*) the blood pictures; (*b*) the gross pathologic changes, and (*c*) the histologic changes in pernicious anemia and lymphatic leukemia. 7. (*a*) Discuss the criteria of malignancy. (*b*) Name five tumors, giving sites, which are malignant. (*c*) Name five tumors, giving sites, which are not malignant.

Laboratory Examination.—During the written examination each candidate was given gross specimens and microscopic sections chosen from the following: cancer of breast, cancer of uterus, congenital cystic kidney; amebic abscess of liver; pyemic lung; lobar pneumonia; tuberculous lung; hypertrophic heart; contracted kidneys; vegetative endocarditis (*Streptococcus viridans*); aortic aneurysm; duodenal ulcer; cancer of the pylorus involving the head of the pancreas; tuberculous ulcers of the small intestine; typhoid hyperplasia of small intestine; fat necrosis; tuberculous peritonitis; colloid goiter; infarct of spleen; osteosarcoma of tibia; Pott's spine; osteomyelitis. Microscopic: cancer of breast; cancer of lip; tuberculosis of lung; chronic nephritis; tuberculosis of bone; exophthalmic goiter; cancer of uterus.

OBSTETRICS

Examiner, Dr. Austin Flint; associate examiners: In Chicago: Drs. W. G. Lee, D. S. Hillis and W. F. Hewitt. In St. Louis: Drs. A. S. Schlosstein and Otto H. Schwarz.

Written Examination.—1. (*a*) From the time of conception, what are the sources from which the ovum (and subsequently the embryo) draws its nourishment? (*b*) What changes take place in a woman at the menopause? 2. Describe the mechanism of labor: (*a*) In a simple flat pelvis, moderate degree, cephalic presentation. (*b*) In a normal pelvis, head extended, chin anterior. 3. (*a*) What are the symptoms indicating low implantation of the placenta? (*b*) Describe the management of such a case in labor at term, membrane unruptured, vertex presentation, cervix three fingers dilated. 4. What are the indications for (*a*) cesarean section; (*b*) version with breech extraction; (*c*) midpelvic forceps operation? 5. Describe the treatment of: (*a*) Puerperal septicemia. (*b*) Threatened eclampsia at the thirty-sixth week of pregnancy.

GYNECOLOGY

1. In a doubtful case, how would you proceed to establish the diagnosis of gonorrhea in a woman? 2. Give the differential diagnosis between: (*a*) Acute septic salpingitis and tubal pregnancy threatening rupture. (*b*) Intraligamentous ovarian cyst and fibroid of the uterus: 3. Describe in detail an operation for the repair of a complete tear of the perineum. 4. What are the indications and contraindications for the use of vaginal tampons, ring pessaries and stem pessaries? 5. Discuss the advantages and disadvantages of removing both ovaries and tubes when doing a hysterectomy for fibroids.

Oral Tests.—During the written examination each candidate was required to make demonstrations on the manikin and to explain different obstetric operations.

BACTERIOLOGY, SEROLOGY AND PARASITOLOGY

Examiner, Admiral E. R. Stitt. Associate Examiners: In Chicago: Drs. Arthur I. Kendall and D. J. Davis. In St. Louis: Drs. M. S. Fleisher and L. S. N. Walsh.

Written Examination.—1. (*a*) Give a simple method of culturing anaerobes. (*b*) Briefly discuss the subject of botulism, giving name and characteristics of causative organism, and practical importance of the infection (*c*) What do you know concerning *Bacillus fusiformis?* 2. How has the recent epidemic of influenza altered our views as to the etiology of the disease? Prepare a concise statement not exceeding three pages. 3. (*a*) Briefly discuss the nonpathogenic acid-fast bacteria and method of differentiation from the tubercle bacillus. (*b*) What are the usually recognized types of tubercle bacillus, and discuss their relation to clinical types of tuberculosis in man? (*c*) Name the diseases in which the question of secondary infection is of importance. 4. (*a*) Discuss serologic methods of separating meningococcus groups from one another and from the gram-negative organisms frequently isolated from the nasopharynx. (*b*) Name the diseases against which prophylactic vaccination has been of value during the World War. (*c*) Briefly discuss methods of desensitization. 5. (*a*) Name the common trematode, cestode and nematode parasites of man (give only four in each group with zoological and common name). (*b*) How do the sexual forms of estivo-autumnal malaria differ from the nonsexual ones? (*c*) What is the nature of the parasite causing African sleeping sickness?

Laboratory Examination.—The examiner is provided with tubes, plates, etc., of various standard culture mediums. The candidate is examined as to the composition, uses, technic of inoculation and study of these. There are also provided plates of plain agar, blood agar, etc., showing colonies, and the candidate is examined as to his ability to recognize and discuss colony characteristics with the unaided eye and magnifying glass. Various serologic preparations, such as Wassermann or other complement fixation tests, microscopic agglutination, precipitin reactions, etc., are provided, and interpretation of these is required. Specimens of intestinal parasites and their ova, together with stained smears of blood preparation of parasites, will be given the candidate for identification.

HYGIENE

Examiners, Surgeon-General Rupert Blue, U. S. P. H. S.; Col. W. C. Rucker, Assistant Surgeon-General, U. S. P. H. S.

Written Examination.—1. What points should be stressed in the sanitary inspection of a public restaurant? 2. What directions should a practicing physician give to prevent the familial spread of whooping-cough? 3. Briefly outline the various methods of water purification. 4. Discuss mental hygiene in the home. 5. How would you prevent the spread of smallpox in a hotel?

MEDICAL JURISPRUDENCE

Examiner, Dr. Isadore Dyer.

Written Examination.—1. State generally the causes for which a license to practice medicine can be revoked. 2. Describe the Harrison act as it applies to the practice of medicine. 3. What do you understand by vital statistics, their scope and purpose? 4. State what you understand by the term "quarantine" as applied to contagious and reportable diseases. 5. A man employed in a factory, while carrying a box of goods upstairs, falls against a loosened steam pipe and is scalded over an area about 6 inches square in the lumbar region. In claiming damages he bases the claim on the severe burn received. Examination in court is ordered one year after the accident. What condition would you expect to find in evidence? (*a*) If he had a burn of the first degree? (*b*) If he had a burn of the second degree?

Book Notices

COLLECTED STUDIES ON THE PATHOLOGY OF WAR GAS POISONING. From the Department of Pathology and Bacteriology, Medical Science Section, Chemical Warfare Service. Under the Direction of M. C. Winternitz, Major M.C., U.S.A. Published with the Consent of the Surgeon General, U. S. Army, and the Director, Chemical Warfare Service. Cloth. Price, $20. Pp. 165, with illustrations. New Haven: Yale University Press, 1920.

This magnificently printed book contains a complete review of experimental work on the pathologic changes observed in experimental animals subjected to various war gases, during the investigations carried out with these substances at Yale University and at the American University at Washington, D. C., under the direction of the Bureau of Mines and the Chemical Warfare Service. The effects of chlorin, phosgen, chlorpicrin, superpalite, "mustard" gas, cyanogen chlorid and bromid, arsin and organic arsenic compounds are described. These studies have been carried out in great detail, with especial reference to the comparative features of poisoning with the different gases. No human material is described, thus differing from the monograph on "mustard" poisoning by Warthin and Weller, recently reviewed in these columns. The importance of the breaking down of resistance to bacterial infection from mouth organisms is especially emphasized. Particular stress is laid on what the author believes to be evidence that edema within the lungs is of itself not so important a factor in causing symptoms or death as has commonly been believed. It is stated that up to 20 c.c. of salt solution per kilogram of animal, or from 200 to 400 c.c. for an ordinary size dog, can be injected directly into the trachea without harm, although the lung is so completely filled with this salt solution that the excess begins to come back. It is also stated that as much as 3,000 c.c. of salt solution has been injected into the trachea of a dog in thirty minutes without any serious harm being observed. In these experiments the lungs are flooded with salt solution, and as the solution ceases to flow out of the trachea and mouth they are again flooded; or else a continuous small stream is allowed to flow into the lung throughout the experiment. Experiments showed that the salt solution had not simply short-circuited through the bronchi and out again but had entered the alveoli extensively. The salt solution that remains in the lung after the experiment is absorbed within three or four days. It is suggested that such irrigation of the lung might even be possible as a therapeutic method under certain conditions, since materials employed as indicators can be washed out of the lungs by this means. It is not made clear how the animal escapes drowning in such an experiment, or how it is able to carry on respiration with the respiratory passages full of fluid.

The justification for so expensive a form of reproduction of research work is certainly open to question. The selling price of this book of 165 pages is $20, which means, of course, that its circulation will be virtually limited to distribution copies and to the files of a few libraries. The expense is chiefly from the presence of forty-one large colored

plates and a great number of black and white illustrations. Even the excellence of these plates will seem to many scarcely to justify the expense of reproducing all of them, since in most respects the information given by many of the plates can be adequately conveyed by descriptions in the text. Such simple conditions as ordinary pulmonary edema or congestion of the pulmonary capillaries are made the subjects of special colored plates.

LEHRBUCH DER AUGENHEILKUNDE. Von Dr. Paul Römer, Geh. Medizinalrat, o. ö. Professor der Augenheilkunde. Third edition. Paper. Price, 30 marks. Pp. 496, with 297 illustrations. Berlin: Urban & Schwarzenberg, 1919.

The third German edition of Roemer's textbook is an improvement on its predecessors in its reduced size and in the fact that less emphasis is placed on theoretical matters. Much of absorbing interest to the specialist, however, is found along these lines, for instance, his vigorous attack on the prevailing Leber theory of the constant formation and circulation of the aqueous humor, and Grawitz's contention that the leukocytes of corneal inflammation and repair are derived from the fixed corneal cells, and that the most constant finding in fresh glaucoma eyes is an edema of the back of the eye due to a swelling of the vascular tunic. Roemer accepts the Fuchs findings in sympathetic ophthalmia, and deals a hard blow to Elschnig's anaphylactic theory in a single short paragraph. He makes the points first, that anaphylactic phenomena are in no way concerned with the origination of inflammation, as contended by Elschnig, but represent only the expression of the protective capacity of our organism against protein products, and, second, that resorption of one's own injured uveal tissue cannot lead to oversusceptibility of one's organism, because there is no such thing as autoanaphylaxis. Among the newer things, one may note the irrigation treatment in ophthalmia, the description of "inclusion blennorrhea" in the new form, and the use of gentian violet along with zinc in angular conjunctivitis, ethylhydrocuprein in serpentic ulcer, benzosalin in sympathetic ophthalmia, and bloodletting and chloral hydrate to control acute congestive glaucoma. He gives first place among operations to trephining in both chronic congestive and simple glaucoma. There is an excellent chapter on the Wassermann reaction and another on tuberculin in diagnosis. One is astonished, however, to find "rheumatism" still given in the etiology of iritis, and no mention of focal infections. Possibly American medicine is a bit conscious of its own achievements, nowadays, but we can see no justification for ignoring the name of Bullers in connection with the shield of the other eye in gonorrheal ophthalmia; of the Ferdinand Hotz trachoma operation, or of the brilliant work of Woodyatt in reducing intra-ocular tension by means of intravenous glucose injections. The work is well supplied with colored plates, and is helped by marginal notes and short topic sentences. For the first time in any eye textbook, public health matters and measures, such as school examinations, compulsory notification of gonorrheal ophthalmia, and the prevention of trachoma and eye accidents, are given the special consideration and strong emphasis they should have.

HANDBOOK OF ANAESTHETICS. By J. Stuart Ross, M.B., Ch.B., F.R.C.S.E., Lecturer in Practical Anaesthetics, University of Edinburgh. Introduction by Hy. Alexis Thompson, C.M.G., M.D., F.R.C.S.E., Professor of Surgery, University of Edinburgh. Chapters upon Local and Spinal Anaesthesia by William Quarry Wood, M.D., F.R.C.S.E., Lately Temporary Assistant Surgeon, Edinburgh, Royal Infirmary, and upon Intratracheal Anaesthesia by H. Torrance Thomson, M.D., F.R.C.S.E., Anaesthetist to the Leith Hospital. Cloth. Price, $2.50. Pp. 214 with illustrations. New York: William Wood & Co., 1919.

This is a convenient pocket edition on the subject, useful for students taking the course. It is well written, and good suggestions are made for recognizing, and also avoiding the danger zones of anesthesia. Ross dwells lightly on several theories of shock without giving anything new or conclusive on the subject. He is instructor in a Scottish university, and he describes at length the various forms of anesthetic apparatus used at home, while giving only passing notice of those used in America. He advocates the use of preanesthetic narcotics, which is sound in practice, and is gaining in popularity in this country.

Medicolegal

Admissibility of Evidence Touching Mental Capacity—Imbecility

(State v. Kelsie (Vt.), 108 Atl. R. 391)

The Supreme Court of Vermont, in overruling exceptions in this case, in which there was a conviction of murder in the first degree, says that the defendant called a physician as a witness, and, having qualified him as an expert in mental diseases, and having shown by him the examinations, observations and tests to which the defendant was subjected, he drew from the witness the statement that as a result the witness had reached the conclusion that the defendant, who was then nearly 34 years of age, had the mental capacity of a child only 8 years old. The witness was then asked how, from a medical standpoint, an adult of that mentality is classified, and replied, "As an imbecile." On motion by the state, that answer was stricken out. The witness was then asked, "From your observations and tests, Doctor, what would you say Mr. Kelsie is?" This question was objected to by the state, and was excluded by the trial court. Assuming for the purposes of this discussion that it was sufficiently apparent that he would have answered that he regarded the defendant as an imbecile, the ruling was without error. Such an answer would have added nothing to the testimony of the physician, as given. He was allowed to give, and did give, during his examination and cross-examination a very clear, comprehensive and intelligent account of the various tests that were applied to the accused to determine his physical condition and his mental development, together with his responses and reactions, and from it all gave his conclusion that the accused was mentally and morally an 8 year old boy. The purpose of this evidence was apparent. At common law an infant under the age of 7 years was conclusively presumed to be incapable of committing a crime. Between 7 and 14, he was presumed to be incapable, but the fact might be shown otherwise. Above 14, he was presumed to be capable, but this presumption was rebuttable. So if common-law rules were to be applied, the defendant had by this evidence, if believed, raised a presumption of his incapacity, and made a jury question of it. If the witness had added that he regarded Kelsie an imbecile, the statement would have afforded the jury no additional aid in estimating the man's mentality. For the term "imbecile" has no fixed meaning in the law, and would require definition by the witness to ascertain the meaning which he ascribed to it. There are grades of imbecility, just as there are grades in insanity, and in the matter of criminal responsibility, the law makes no distinction between imbecility and insanity. The test of the law in all cases is, Did the accused, as applied to the act in question, have the mental capacity to understand the character, consequences and quality of such act, and successfully to resist the impulse to do it?

Another physician was a witness for the defense, and testified that when the defendant was a child he treated him for epilepsy. When the physician mentioned first was under cross-examination by the state's attorney, he was asked if in his examinations of the defendant he discovered any signs of epilepsy, and subject to exception he replied that he did not. The only objection made to this question and answer was that the defendant did not examine this witness regarding epilepsy. But the rule that the cross-examination is circumscribed by the direct examination does not mean that a cross-examiner is limited to the specific inquiries of the examiner. A witness may be cross-examined in respect of his examination in chief in all its bearings, and as to anything that tends to explain, characterize or modify what he has therein stated. The mental and physical symptoms and conditions of the defendant were the most prominent features of the direct testimony of this witness. Anything germane to those subjects and pertinent to the questions involved in the trial was a proper matter of inquiry in cross-examination. Specific reference to epilepsy in the examination in chief was not necessary to make proper in cross-examination the question objected to; and this ruling, too, was without error.

Care Required in Selecting and Retaining Physician

(Woody v. Carolina Spruce Co. (N. C.), 101 S. E. R. 258)

The Supreme Court of North Carolina, on the third appearance before it of this case, affirms a judgment in favor of the plaintiff, who sued the defendant company for damages which he alleged that he had sustained through the negligence and malpractice of a physician employed by the defendant but compensated by sums collected monthly from its employees, of whom the plaintiff was one when he was injured and required the services of the physician. The court said before that the defendant was under no legal obligation to employ a physician to treat its employees, but when it assumed to do so and to deduct a monthly sum from their wages for medical attention, it was under obligation to exercise due care in selecting the physician and in continuing him in its service. To the same effect the court now holds that there was no error in instructing the jury in substance that if it found by the greater weight of the evidence that the defendant engaged the physician in question to treat the plaintiff and other employees, and after it had notice of his incompetence and unskilfulness, it continued him in its employment, the jury should find the defendant negligent in so continuing him in its employment. The defendant owed the duty to the plaintiff, after it had undertaken to secure a physician for him, to secure one of reasonable skill and ability. There was no other physician, so far as it appeared, immediately at hand, and the plaintiff had paid his assessments for the employment of the company's physician, and, though he may have had doubts as to his competence, when the president of the company assured him that the fracture was simple and that he and the physician could set the fracture as well as any one, the plaintiff was not guilty of contributory negligence, nor did he assume the risk, by trusting to the assurance of the president, under the circumstances of the case. The reply of the president was equivalent to telling the plaintiff that the company would not employ any other physician, and that the plaintiff had to take the service offered to him or go without medical treatment.

Who Must Make Required Inquiry Before Corpses May Be Used for Dissection

(Burke et al. v. New York University (N. Y.), 179 N. Y. Supp. 626)

The Supreme Court of New York, Special Term, New York County, in sustaining a demurrer to the complaint, with leave to the plaintiffs to serve an amended complaint, says that the action was brought by the children of a man who had died in a hospital, to recover damages for injury to their feelings due to the act of the defendant, through its medical department, in dissecting the body of their deceased parent. After the father's death his body had been taken to the morgue, which delivered it to the defendant. Now Section 316 of the Public Health Law of New York not only permits, but in certain cases requires, morgues and other institutions and persons named to deliver any corpse in their possession not placed there by relatives or friends for keeping or burial to medical institutions like the defendant. The statute prohibits such delivery or receipt, however, of the corpse of any person "known to have relatives or friends, without the assent of such relatives or friends." The court takes it that these words necessarily mean known to the institution charged with the wrongful receiving of a corpse, or, what is equivalent to knowledge, lack of reasonable inquiry. But the statute seems to place on the persons having control of the institutions mentioned and having possession of such corpses the duty of ascertaining whether any particular corpse is one "which may be delivered . . . under this section." The persons so in control in this case were those who had charge of the morgue, and the statute would appear to have placed on them the duty of making inquiry to ascertain whether the particular corpse was that a person "known to have relatives or friends." Since it was their duty to make such inquiry, it is not apparent that any useful purpose would be accomplished by requiring the defendant to make the same inquiry over again, and, in the absence of plain language to that effect, the statute should not be held to have intended duplication of inquiry.

Society Proceedings

COMING MEETINGS

Canadian Medical Association, Vancouver, B. C., June 22-25.
Maine Medical Association, Augusta, June 29-30.
Montana State Medical Association, Helena, July 14-15.
Nevada State Medical Association, Lake Tahoe, June 25-26.
Southern Minnesota Medical Assn., Fairmont, Minn., June 28-29.

AMERICAN SOCIETY FOR CLINICAL INVESTIGATION

Annual Meeting, held in Atlantic City, N. J., May 3, 1920

(Continued from page 1669)

Clinical and Electrocardiographic Observations on Inversion and Other Anomalies of the P Wave

DR. WALKER W. HAMBURG, Chicago: Eighteen cases of inversion of the P wave (migration of the pacemaker) are reported: twelve cases with normal rhythm and six cases with arrhythmia (auricular extrasystoles). Inversion of the P wave is most frequent in Lead 3; five cases showed inversion in Leads 2 and 3, and one case, Leads 1, 2 and 3; five cases showed a diphasic P; four cases, bifurcated P. Analysis of these cases discloses that the majority of them suffer with varying degrees of myocardial insufficiency and are associated with acute or chronic infectious processes. In addition, evidence of vagal influence is frequent, as shown by disturbances in respiration, effect of atropin, occurrence in vagotonic individuals, etc. Electrocardiographic study of cases showing inverted P, or of cases occurring in suspect vagotonic individuals should include the effect of (*a*) deep breathing, (*b*) change of posture, (*c*) atropin and (*d*) the effort test.

Results of Antemortem Lung Punctures in Lobar Pneumonia; Their Bearing on the Mechanism of Crisis

DRS. HENRY M. THOMAS, JR., and FREDERIC PARKER, JR., Boston: Study of lung puncture performed to hasten or confirm bacteriologic diagnosis of lobar pneumonia yields interesting facts. Incidentally, the procedure of puncturing solid lung was entirely innocuous. It was found that the mortality of patients yielding viable organisms by lung punctures after the fifth day of disease was 56 per cent., whereas patients yielding no organisms by lung puncture, no matter what day of the disease, with two exceptions, recovered. Positive lung punctures were obtained, however, just before, during and just after crisis in a few cases. These facts seem to indicate that destruction of the organisms is the first step toward recovery, but also that crisis may occur before the organisms have been entirely killed, or several days after. That definite antibacterial properties are developed in the blood has been shown by many investigators; but that these properties are in any way efficacious in combating the toxic manifestations of lobar pneumonia has not been claimed. We offer our results as further evidence that two mechanisms—antibacterial and detoxifying—act, in a measure, independently. That the second mechanism may be brought about by a sudden change in ferment-antiferment balance seems quite likely, but the possibility of true toxin-antitoxin reaction has not been definitely ruled out.

DR. FREDERICK T. LORD, Boston: There are certain considerations which suggest, as Dr. Thomas has mentioned, that a dual mechanism may be responsible for recovery from lobar pneumonia. The demonstration in small amount of protective substances in the blood at about the time of the crisis and the presence of agglutinins and bacteriotropic substances, operative against the homologous organism, suggest that humoral immunity is of importance in recovery and may serve to check the septicemia and limit the spread of the local lesion. There are, however, certain observations in conflict with the humoral theory as an entirely satisfactory and complete explanation of recovery. The humoral factors are, for example, less constantly and strikingly demonstrable than might be expected were they the sole explanation of so

decisive an event as the crisis. Blake and Cecil's observation that monkeys with experimental pneumonia may die with septicemia and the local lesion be found at necropsy to be undergoing resolution may have a bearing on this matter. In such cases it is suggestive that humoral immunity may fail, while certain local factors influencing recovery may succeed. In human cases the successive pneumonic invasion of different lobes may be observed during life, with recession of the earlier lesions coincident with the spread of the later processes. At necropsy it is not uncommon to find in the same subject several pneumonic areas in different stages of development. At times a consolidated area previously recognized during life may be found at necropsy to have undergone almost complete resolution, while one or more areas are in a stage of earlier development. Recovery from lobar pneumonia fails to confer any considerable or lasting protection against subsequent attacks. A repetition of pneumonia in certain persons is so common as to suggest that the duration of humoral immunity is short, and may actually give place to a condition of increased susceptibility. Relapsing pneumonia within a few days of crisis or lysis is uncommon; but during the last few years we have had one case of Type I, another of Type II and a third of Type III pneumonia with apparent recovery, followed by a second attack due to the same organism after an afebrile interval of only a few days. The occurrence, reported to me by Dr. Benjamin White, in three horses, highly immunized against Type I pneumococcus, of a fatal Type I pneumonia indicates that even a high degree of acquired immunity does not prevent the development and progress of a local lesion. In such cases one may assume that the local factors influencing recovery failed.

In seeking an explanation of the local factors that may influence recovery, our attention has been directed to the chemistry of the pneumonic exudate. From evidence in favor of partial isolation of the pneumonic lung, an increase in the local H ion concentration and the short viability and rapid dissolution of the pneumococcus at an equal degree of acidity, we have been led to believe that local biochemical changes may be of importance in recovery.

Catalase Content of the Blood in Different Types of Anemia

DRS. E. B. KRUMBHAAR and JOHN H. MUSSER, JR., Philadelphia: The catalase content of the blood was compared with the erythrocyte count in nine cases of pernicious anemia, eleven cases of other primary and secondary anemia, and nine normal controls. Contrary to Van Thienen's observation that the catalase content was always relatively high in pernicious anemia, we found that it was as low in this disease as in other anemias, and always lower than in nonanemic persons. The variations in different persons were roughly proportional to the differences in erythrocyte counts, so that the "catalase index" (obtained by dividing the number of cubic centimeters of oxygen liberated by 0.1 c.c. of blood during fifteen minutes by the erythrocyte count expressed in millions) gave very close averages for the three groups (pernicious anemias, 28.6; other anemias, 28; normal cases, 32.7). In anemia following experimental splenectomy the catalase content of the blood fell; when the blood picture improved after removal of a diseased spleen, the catalase content increased; but in both cases the index remained approximately unchanged.

Effect of Small Doses of Roentgen-Ray on Lymphoid Deposits

DR. JAMES B. MURPHY, New York: It is a matter of common observation that lymphoid tissue is more vulnerable to infections than are other tissues; also it is well known that in these tissues infections tend to persist and are less amenable to treatment than in other tissues. Since such a state is peculiarly characteristic to this tissue, it would seem that the lymphoid elements constitute an important contributing factor, and, if this is true, a reduction of these elements in infected lymphoid tissue might so alter the course of infection that its tendency to persist would be diminished. The utilization of the roentgen ray affords a method of approach to such an experimental investigation, since through the selective action of the roentgen ray for the lymphoid elements it may be hoped to effect a considerable reduction of them and at the same time do no injury to other tissue elements.

Infected tonsils seemed to offer suitable material to which this method of investigation might be applied, and preliminary observations on results obtained were most satisfactory. A number of patients with infected tonsils have been selected from various clinics by those in charge of the clinics and sent to us for treatment and observation. These have included types of hypertrophied and atrophic infected tonsils, with characteristic involvement of the surrounding tissues, associated with constitutional disturbances. After noting the general condition of tonsils and neighboring tissues, cultures on blood agar have been prepared from material obtained by passing a sterile platinum loop into the crypts of the tonsils, and from the postnasal vault. Immediately following this procedure, crossfire treatments of filtered roentgen ray have been given. These patients have then returned at weekly intervals for further observation, at each visit additional notes have been made and cultures again made. The original cultures from all individuals showed either hemolytic streptococci or hemolytic staphylococci.

The results following the roentgen-ray treatment are striking. After the first week the injection of the surrounding tissues has disappeared, as also has excess lymphoid tissue previously noted along the margins of the pillars; and where accumulations of tissue had been noted in the postpharynx, it is seen to be definitely lessened in amount. By the third week and after, cultures are free from the hemolytic cocci previously recovered in abundance. When tonsils were at the beginning hypertrophied, they are seen to be much diminished in size. It would seem in the light of the results briefly stated that with the elimination of the lymphoid elements from infected lymphoid tissue the course of the infection has been arrested, since no other treatment than the roentgen-ray exposure has been used. While it is yet too soon to form any opinion regarding more remote effects, from a clinical point of view the present observations form a basis for further development and present a possible method of treatment of infected tonsils other than surgical interference.

Chemical Difference Between the Young Erythrocytes from the Blood of Pernicious Anemia Cases and Normal Individuals

DRS. EDWIN LOCKE and T. E. HACKMAN, Boston: Blood specimens from six cases of pernicious anemia showing from 5 to 12 per cent. of reticulated cells, four cases of hemorrhagic (acute) anemia showing from 5 to 12 per cent. of reticulated cells, one case of acquired hemolytic jaundice with 16 per cent. of reticulated cells, two cases of pernicious anemia and four normal cases with less than 1 per cent. of reticulated cells were studied with respect to (1) the resistance of the cells to hypotonic salt solutions; (2) the oxygen consumption of the cells, and (3) proteolysis (loss of amino acid nitrogen) and creatin consumption during incubation at body temperature. The cells from the cases of pernicious anemia with an increased number of reticulated cells showed uniformly less oxygen consumption than the cells from the hemorrhagic cases, and always a marked proteolysis and loss of creatin. The cells from the hemorrhagic cases and the case of hemolytic jaundice showed no proteolysis and from slight to marked gains, but never loss, of creatin. Cells from normal individuals and from cases of pernicious anemia with less than 1 per cent. of reticulated cells showed insignificent variations with respect to oxygen consumption, proteolysis and creatin consumption (or loss). All the cases of pernicious anemia with increased numbers of reticulated cells showed a greater percentage of these cells in the lower than in the higher dilutions of hypotonic salt solutions. The reverse was true in the case of acquired hemolytic jaundice. The findings in the hemorrhagic cases were, in this respect, not constant. These observations suggest that the young erythrocytes seen in pernicious anemia are atypical and biologically less hardy than the "normal" reticulated cells found after acute hemorrhage.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Insanity, Baltimore

April, 1920, **76**, No. 4

*Psychosis Associated with Tetany. A. M. Barrett, Ann Arbor, Mich. —p. 373.
*Nature of Substance Causing Colloidal Gold Reaction. P. G. Weston, Warren, Pa.—p. 393.
Anticipation of Paresis and Tabes in Syphilitics. S. Brown, Kenilworth, Ill.—p. 397.
Thymic Reactions in Differentiation of Neurotic from Psychotic Conditions. D. Gregg, Wellesley, Mass.—p. 403.
Classification of Industrial Applicants. A. W. Stearns.—p. 409.
Nervous and Mental Disorders of Soldiers. S. Brown.—p. 419.
Amnesias in War Cases. D. A. Thom and N. Fenton.—p. 437.
*Neurosyphilis Investigation of Massachusetts Commission on Mental Diseases. O. J. Raeder, Boston.—p. 449.
Dissociated Personality: Analysis of its Psychologic Problems. E. E. Mayer, Pittsburgh.—p. 465.

Psychosis Associated with Tetany.—From an analysis of cases, Barrett is convinced that there is no specific tetany psychosis, but that the neuromuscular disturbances and the psychosis are both the result of a toxic process affecting the central nervous system. In two cases reported by him this disturbance seems to have had some relationship to disease of the pituitary body.

Nature of Colloidal Gold Precipitating Substance.—According to Weston the colloidal gold precipitating substance in the spinal fluid of paretics is a globulin. It is not the Wassermann reacting substance and can be separated from the latter quantitatively. This explains why there may be a paretic curve in the gold test with either a positive or negative Wassermann reaction.

Neurosyphilis.—A complete recovery mental, physical, and laboratory, after less than five years or ten years or even before death Raeder says may be questioned. An apparently recovered neurosyphilitic may show none of the above signs or findings, yet at necropsy following intercurrent disease of senility, a focus of inactive treponemas may be found to occupy a circumscribed area somewhere in the brain, just as is commonly found an area of fibrosis or calcification in the lungs, the scar of a healed tuberculosis. In 428 cases of neurosyphilis treated during a period of four years, 129 cases or practically 30 per cent. showed definite benefit. One hundred twenty-five patients are under treatment in hospitals of which a certain percentage can be expected to show similar improvement. The relatives (spouses, parents, offspring) of syphilitics and neurosyphilitics form a most important group in which not only syphilis but the earliest degrees of neurosyphilis, in the presymptomatic, often entirely unsuspected, stages, are brought to light by lumbar puncture and sero-analysis. It is in these types that by far the most benefit can be expected.

American Journal of Public Health, Boston

April, 1920, **10**, No. 4

American Public-Health Association, Present, Past, and Future. W. S. Rankin, Raleigh, N. C.—p. 297.
Protective Value of Typhoid Vaccination as Shown by Experience of American Troops in War. G. A. Soper, New York.—p. 301.
Importance of Confirmatory Colon Bacillus Tests in Fairly Safe Drinking Water. N. Novick, East Norfolk, Mass.—p. 305.
*Bacteriologic Examination of Soft Drinks. W. R. Stokes, Baltimore. —p. 308.
Treatment of Beet Sugar Plant Sewage. L. Pearse and S. A. Greeley, Chicago.—p. 312.
*What Should be the Basis of the Control of Dehydrated Foods? S. C. Prescott, Cambridge, Mass.—p. 324.
Sociologic Aspects of Housing. I. S. Wile, New York.—p. 327.
Traffic Regulation as a Means of Preventing Injury and Death from Street Vehicles. S. J. Byrne, Brooklyn.—p. 331.
Diphtheria Bacillus Stains; Description of a "New" One. H. Albert, Iowa City, Iowa.—p. 334.
Infant Mortality in Registration Area for Births. W. H. Davis, Washington, D. C.—p. 338.
Purification of Oysters as Conservation Measure. W. F. Wells, Albany.—p. 342.
Studies on Viability of Tubercle Bacillus. J. B. Rogers, Cincinnati. —p. 345.
Excessive Mortality from Influenzal Pneumonia Among Bituminous Coal Miners of Ohio in 1918. E. B. Starr, Columbus.—p. 348.
Early School of Public Health at Lyons, France. W. T. Sedgwick, Cambridge, Mass.—p. 352.

Bacteriology of Soft Drinks.—In his examination of about one dozen well known soft drinks Stokes only sought specially for the colon bacillus, but many soft drinks contain variable numbers of bacteria and this large bacterial content may be explained partially by the improper sterilization of bottles. A few bacteria remaining in the bottles may increase in the small quantity of water often left in the bottle after sterilization. Dust organisms getting into the bottles may also resist sterilization even if the bottles are dried properly. This matter may be of some importance in relation to the possibility of intestinal infection, since the organisms which produce so-called food poisoning often find a favorable culture medium in the carbohydrates of these soft drinks.

Use of Dehydrated Vegetables.—From the practical standpoint, Prescott says the use of dehydrated vegetables is to be commended, providing they can be prepared from the best quality of raw material and by methods which conserve the food values to the highest possible degree. The great advantages of dehydration in making possible the utilization of materials which now goes to waste, in reducing the cost of carriage, in their easy transportability to all parts of the world, in the saving of expensive containers and in the stabilization of agriculture and the price of materials, seem incontrovertible and argue strongly for the development of this industry.

American Journal of Roentgenology, New York

April, 1920, **7**, No. 4

Oil Immersed Roentgen Ray Generating Outfits. W. D. Coolidge, Schenectady, N. Y.—p. 181.
Radium Treatment of Enlarged Thymus Glands in Infants. A. C. Heublein, Hartford, Conn.—p. 191.
Tests of Roentgen-Ray Intensifying Screens. R. B. Wilsye, Rochester, N. Y.—p. 196.
Radium in Treatment of Carcinoma of Cervix and Uterus. R. H. Boggs, Pittsburgh.—p. 202.
Roentgenotherapy in Malignant Disease Within the Abdomen; Reports of Cases. G. E. Pfahler, Philadelphia.—p. 210.

Annals of Otology, Rhinology and Laryngology, St. Louis

December, 1919, **28**, No. 4

Case of Influenza, Followed by Pneumonia, Laryngitis, Otitis Media Suppurativa Acuta, Right Side; Tonsillitis, Hypertrophic; Chronic Bilateral Streptococcus Type. J. H. Bryan, Washington, D. C. —p. 1009.
Value of Laboratory Examinations in Diagnosis and Prognosis in Oto-Laryngology. S. Oppenheimer and H. J. Spencer, New York. —p. 1012.
Angiomas of Larynx: Report of Three Cases. G. B. New and C. M. Clark, Rochester, Minn.—p. 1025.
An Ethmoid Operation. J. A. Pratt, Minneapolis.—p. 1051.
Maleruption into Nose of Lateral Deciduous Incisor. V. B. Fischer, Boulder, Colo.—p. 1067.
Case of Otitis Media Suppurative, Chronic, Right, Mastoiditis; Operation followed by Meningitis; Abscess in Temporosphenoidal Lobe of Brain. J. H. Bryan, Washington, D. C.—p. 1083.
Reports for 1918 from Ear and Throat Department of Royal Infirmary, Edinburgh. J. S. Fraser and W. T. Garretson, Salem, Iowa.—p. 1091.
Conservative Surgery of Lateral Sinus. C. C. Jones, Cincinnati. —p. 1164.

Archives of Diagnosis, New York City

January, 1920, **12**, No. 3

Education and Recreation in the Army. W. G. Haan, U. S. Army. —p. 121.
Practical Value and Utilization of Wassermann Test in General Practice. R. A. Kilduffe.—p. 125.

Archives of Neurology and Psychiatry, Chicago

May, 1920, **3**, No. 5

An Account of Witch Craze in Salem, with Reference to Some Modern Witch Crazes. C. S. Potts, Philadelphia.—p. 465.
*Lethargic Encephalitis: Report of Cases and Analysis of Literature. M. E. Alexander and H. E. Allen, Waterbury, Conn.—p. 485.
*Neurosyphilis and Psychoses. L. G. Lowrey, Boston.—p. 500.
*Heredity in Exophthalmic Goiter. Report of Two Juvenile Cases. H. Climenko, New York.—p. 530.
*Curative Influence of Influenza in a Case of Specific Meningomyelitis with Cystitis. C. W. Burr, Philadelphia.—p. 536.

Brain in Lethargic Encephalitis.—One of the cases reported by Alexander and Allen terminated in death. Examination of the brain revealed congestion of the meninges with considerable dilatation of the veins. Over the parietal region there appeared, here and there in the pia arachnoid, a small exudate, following the course of sulci. At the base there was intense congestion with a graying yellow exudate of moderate degree in the region of the optic chiasm. Cultures taken from the exudate and from the cortex of the brain showed no growth. Smears showed red blood cells, lymphocytes, mononuclear cells and an occasional polynuclear cell. No organisms were found with methylene blue and acid fast stains. On section of the formaldehyd hardened brain, the ventricles appeared slightly dilated, but the ependyma and choroid plexuses were normal. Sections from the cortex (parietal and occipital lobes) showed in each instance considerable involvement of the meninges. The blood vessels were dilated and there was an accumulation of inflammatory cells in the pia arachnoid consisting chiefly of lymphocytes and mononuclear cells. The cortica gray and subcortical white matter showed dilated vessels, and here and there capillaries surrounded by a few lymphocytes. Sections of the base of the brain showed most marked involvement in the region of the optic thalmus. Here no hemorrhages were evident, but the capillaries were distended with blood There was marked perivascular infiltration with lymphocytes and mononuclear cells. In places underneath the pia anachroid and in the substance of the brain an accumulation of lymphoid cells was present. In other places there was a heaping up of endothelial cells of the pia directly in contact with the brain substance. In the pons the vessels were congested, but the perivascular infiltration was less marked. In the medulla, at the floor of the fourth ventricle, the congestion was much more apparent. There were several hemorrhagic areas, the vessels and capillaries were dilated and surrounded by a perivascular infiltration of lymphocytes and mononuclear cells.

Neurosyphilis and Psychoses.—Nineteen cases are presented by Lowrey of which fourteen were undoubted cases of neurosyphilis, one case of pseudoparesis and four had negative physical and equivocal serologic findings. Of the fourteen undoubted cases only four presented clinical evidence from which a diagnosis of neurosyphilis could be made. Since neurosyphilis may exist in association with any type of mental symptoms, and since such states may exist in the absence of any of the usual signs and symptoms of neurosyphilis, Lowrey urges that lumbar puncture should be done at least in all cases which present any atypical features. It is equally important to puncture in cases with any clinical signs of neurosyphilis, since the signs may be misleading.

Hereditary Exophthalmic Goiter.—Climenko's patients were related: mother, two daughters and children of each of these —a boy, in one case and a girl in the other. The transmission was a direct one and along the female line. It is emphasized that the occurrence of exophthalmic goiter in a boy, aged 10, and in a girl, aged 6, is in itself an extremely rare condition.

Curative Effect of Influenza.—Burr's case is an example of the favorable influence exerted by an acute infection—influenza—on an illness of many months' duration, enabling a bedridden woman suffering from an old meningomyelitis, with severe cystitis, to recover sufficiently to do housework.

Boston Medical and Surgical Journal

May 27, 1920, **182**, No. 22

John Hunter at Oxford. H. Viets, Boston.—p. 545.
Fracture of Posterior Tubercle of Astragalus vs. Inconstant Os Trigonum. F. W. O'Brien, Boston.—p. 548.
Urological Cases. W. C. Quinby, Boston.—p. 551.

Bulletin of Medical and Chirurgical Faculty of Maryland, Baltimore

February, 1920, **12**, No. 5

Argument in Favor of Establishment of Medical Newspaper Comparable to Trade Journal of Other Walks of Life. B. M. Bernheim, Baltimore.—p. 81.

Colorado Medicine, Denver

April, 1920, **17**, No. 4

Artificial Menopause Induced by the Roentgen Ray. C. E. Giffin, Boulder.—p. 84.
Personal Reminiscences of Earlier Years of Sir William Osler. E. J. A. Rogers, Denver.—p. 88.
Hernias in Children. L. J. Weldon, Denver.—p. 95.
Complete Epispadias; Review of Literature. L. I. Miller, Denver. —p. 97.

Florida Medical Association Journal, St. Augustine and Jacksonville

March, 1920, **6**, No. 9

Care and Individuality in Obstetrics. J. H. Bickerstaff, Pensacola. —p. 168.
Motor Insufficiency and Dilation of Stomach with Therapeutic Suggestions. G. M. Niles, Atlanta, Ga.—p. 170.

Georgia Medical Association Journal, Atlanta

April, 1920, **9**, No. 12

Essential Factors in Public Defense Against Venereal Disease. R. L. DeSaussure, Rome.—p. 85.
What We Have Done in Georgia to Aid in Control of Venereal Diseases. J. P. Bowdoin, Atlanta.—p. 88.
Economic Value of Early Diagnosis and Treatment in Hand Infections. R. H. Wicker, Rome.—p. 91.
Toxic Tonsils. W. C. Lyle, Atlanta.—p. 93.
Radium Therapy for Uterine Hemorrhages. O. D. Hall, Atlanta. —p. 95.

Iowa State Medical Society Journal, Des Moines

April 15, 1920, **10**, No. 4

Rest in Tuberculosis. H. V. Scarborough, Oakdale.—p. 98.
Roentgenology in Diagnosis of Incipient Tuberculosis. A. W. Erskine, Cedar Rapids.—p. 104.
Nerve Injuries of War. A. B. Phillips, Clear Lake.—p. 106.
Relation of Day Schools for Deaf to State Institution. H. G. Langworthy, Dubuque.—p. 108.
Instruction of Deaf. H. W. Rothert, Council Bluffs.—p. 109.
Medical Education in Iowa. D. S. Fairchild, Clinton.—p. 113.
Brief History of Mobile Hospital No. 1. D. Macrae, Jr., Council Bluffs.—p. 118.

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Value of Military Surgery in Civilian Practice. G. W. Crile, Cleveland.—p. 137.
Surgical Management of Gastric and Duodenal Ulcer. J. E. O'Keefe, Waterloo.—p. 142.
Epilepsy. F. M. Williams, Sioux City.—p. 149.

Journal of Orthopedic Surgery, Lincoln, Neb.

May, 1920, **2**, No. 5

*Habitual Dislocation of Shoulder Joint. R. Ollerenshaw, Manchester, England.—p. 255.
*Syphilitic and Tuberculous Joints. P. W. Roberts, New York.—p. 265.
*An Unusual Abnormality of Elbow Joint. L. T. Brown.—p. 268.
Birth Paralysis. H. Platt, Manchester, England.—p. 272.

Habitual Dislocation of Shoulder.—In Ollerenshaw's opinion the deltoid muscle flap operation offers the best means of overcoming the tendency to dislocation because it provides, first, a good sling bracing up the head and neck of the humerus and, second, a muscular sling which contracts when the rest of the deltoid is in action, that is to say, in abduction of the arm, in which position the dislocation occurs.

Syphilitic and Tuberculous Joints.—Roberts has observed more than 200 cases of chronic destructive joint disease with symptoms usually ascribed to tuberculosis which, from their behavior under mercury and potassium iodid, their suggestive family histories, and the presence in many of the patients of dental stigmata, it is reasonable to believe were syphilitic.

Abnormal Spur at Elbow Joint.—In Brown's case a spur formation was present on the inner side of the ulna at the joint line. The spur was so large that it overlapped and curved around the internal side of the trochlea surface of the humerus. At the tip of this spur was a small bony mass which was not connected by bone trabeculae to the spur. There was also a slight amount of hypertrophic arthritis at other parts of the joint. Flexion and extension were limited in degree.

Kansas Medical Society Journal, Topeka

April, 1920, **20**, No. 4

Empyema Complicating Influenza. T. J. Carter, Wichita.—p. 89.
Treatment of War Amputated. T. G. Orr, Kansas City.—p. 92.

Protein Therapy in Hodgkin's Disease. W. E. McVey, Topeka, and D. D. Wilson, Nortonville.—p. 96.

May, 1920, **20**, No. 5

Myocardial Diseases and Cholelithiasis. M. T. Sudler, Rosedale.—p. 119.
Child Welfare in Kansas. L. A. DeVilbiss, Ottawa.—p. 120.
Nasal Accessory Sinusitis. L. B. Spake, Kansas City.—p. 123.

Kentucky Medical Journal, Bowling Green

May, 1920, **18**, No. 5

Auricular Flutter and Use of Electrocardiograph. L. K. Baldauf, Louisville.—p. 151.
Auricular Fibrillation and Auricular Flutter. F. C. Askenstedt, Louisville.—p. 155.
*Appendiceal Abscess Rupturing Through Back. C. B. Spalding, Louisville.—p. 159.
Suffocative Pneumothorax in a Child Aged Five Years. E. F. Katzmann, Louisville.—p. 160.
Two Cases of Pernicious Anemia. C. G. Lucas, Louisville.—p. 161.
Treatment of Rectal Carcinoma. G. S. Hanes, Louisville.—p. 163.
Few Conditions Treated by Means of Neosalvarsan Other than Syphilis Dating from 1914 to Date. S. J. Rose, Winchester.—p. 169.
Influenza as I Saw It. T. H. Hardesty, St. Mary.—p. 170.
Influenza. G. R. Keen, Scottsville.—p. 172.
Treatment of Influenza. S. S. McReynolds, Russellville.—p. 174.
Report of Case. Z. A. Thompson, Pikeville.—p. 175.
Surgery in Rural Districts. C. C. Howard, Glasgow.—p. 176.
Trachoma. J. N. Bailey, Paducah.—p. 177.
Imperforate Anus; Case Report. C. Skinner, Louisville.—p. 178.

Rupture of Appendiceal Abscess Through Back.—In Spalding's case an abscess had formed seventeen years previously half way between the vertebrae and the crest of the ileum on the right side posteriorly, which was opened without the use of anesthesia. A large quantity of pus drained at the time, and the sinus continued to discharge for nine months. At the age of 17 the sinus reopened and discharged for one month. Her health then remained fairly good until an attack of supposed "rheumatism" for which she was treated more than a year, and which culminated in an abscess opening on the outer side of the right thigh at the junction of the middle and lower third, July 1, 1918. The area continued to drain until Spalding saw the patient. At the operation it was found that a ruptured appendix had been the cause of the original abscess.

Maine Medical Association Journal, Portland

April, 1920, **10**, No. 9

Medical Defense. J. A. Spalding, Portland.—p. 263.

Medical Record, New York

May 29, 1920, **97**, No. 22

Diagnosis of Chronic Gallbladder Pathologies. A. Bassler, New York.—p. 899.
Surgery of Gallbladder. J. F. Erdmann, New York.—p. 901.
*Diagnosis of Spinal Cord Tumors. H. Climenko, New York.—p. 903.
Management of Certain Mental and Nervous Cases; A. Medicolegal Aspect. D. E. Hoag, New York.—p. 910.
Stammering; Underlying Causes and Method of Correction. F. Martin, New York.—p. 914.
*Deficient Thyroid Secretion as Etiologic Factor in Gastric and Duodenal Ulcers and Hyperacid Conditions. J. Katz, Brooklyn.—p. 916.
Cooperation of Physician and Dentist Necessary for Success in Treatment of Systemic Diseases. R. R. Reed, Bay City.—p. 916.

Diagnosis of Spinal Cord Tumors.—Pain was a common factor in the three cases cited by Climenko. It expressed itself differently, however, in each case. In two cases of extramedullary tumors, it was an early symptom. In one case of intramedullary tumor, it was of later development. In one case the pain was more like the type of paresthesia at the beginning, and only later did it assume the sharp, lancinating character. In the other two cases it began as a severe sharp, cutting pain, and continued all through the course of the disease. This subjective symptom, pain, is a very valuable guide when properly interpreted. In eliciting this symptom, Climenko says, the patient's psyche must be taken into consideration. The best way is to watch the patient's facial expression when the right question is put and the proper answer is given. The facial expression is particularly valuable in testing for tenderness. An essential point in diagnosis, to which Climenko calls attention, is, that in one case after lumbar puncture the patient became suddenly more paralyzed and the Brown-Séquardian syndrome became more pronounced. This is due to the fact that after a sudden withdrawal of the fluid the tumor pressed more on the cord and produced the given syndrome. Such occurrence, Climenko believes, should be considered as pathognomonic of spinal cord tumors where vertebral disease can be excluded.

Deficient Thyroid Secretion in Gastric Ucer.—Having observed clinically that hyperacidity may be caused by faulty thyroid secretion, and cured or relieved by the administration of thyroid extract, Katz decided to try the use of thyroid extract in the treatment of ulcers of the stomach and obtained good results.

Mental Hygiene, New York

April, 1920, **4**, No. 2

Childhood: Golden Period for Mental Hygiene. W. A. White, Washington, D. C.—p. 257.
Essentials of an Education. S. Paton, Princeton, N. J.—p. 268.
Trade Unionism and Temperament. E. E. Southard, Boston.—p. 281.
Applicability of Findings of Neuropsychiatric Examinations in Army to Civil Problems. P. Bailey, New York.—p. 301.
Experience of Child: How They Affect Character and Behavior. C. M. Campbell, Baltimore.—p. 312.
Program for Mental Hygiene in Public Schools. E. S. Abbot, Philadelphia.—p. 321.
Some Adaptive Difficulties Found in School Children. E. L. Richards, Baltimore.—p. 331.
Mental Disorder in Adolescence. M. A. Harrington, New York.—p. 364.
Mental Deficiency in New York State. W. C. Sandy, New York.—p. 380.
Does There Exist a Need for a Program of Education in Mental Hygiene. D. A. Laird, Iowa City, Iowa.—p. 393.
Nervous and Mental Disorders of Soldiers. S. Brown, Washington, D. C.—p. 404.
What Can Be Done for the Maladjusted? Anne T. Bingham, Baltimore.—p. 422.

Michigan State Med. Society Journal, Grand Rapids

May, 1920, **19**, No. 5

Urterer Stone. G. Kolischer and J. S. Eisenstaedt, Chicago.—p. 190.
Medical Service in Community Hospital. J. G. R. Manwaring, Flint.—p. 191.
Certain Aspects of Hysteria. G. K. Pratt, Flint.—p. 192.
Drainage of Uterus After Labor, Abortion or Menstruation and Its Relation to Septic Infection. G. H. Judd, Detroit.—p. 196.
Errors in Surgical Diagnosis. S. Levin, Lake Linden.—p. 197.
Roads. E. H. Foust, Ithaca.—p. 200.

Missouri State Medical Ass'n Journal, St. Louis

May, 1920, **17**, No. 5

Neuritis. G. W. Robinson, Kansas City, Mo.—p. 184.
Surgical Treatment of Goiter. W. Bartlett, St. Louis.—p. 190.
Prevention of Complications in Pregnancy and Labor. G. D. Royston, St. Louis.—p. 196.

New York Medical Journal

May 29, 1920, **111**, No. 22

Sex Disproportion and Its Consequences. R. M. Leslie, London.—p. 925.
*Secondary Nephrectomy. A. L. Chute, Boston.—p. 931.
Deaf Child in Relation to Parents, Teacher and Physician. F. Amberg, Detroit.—p. 936.
Year's Observation in Orthopedic Surgery. E. Adams, New York.—p. 938.
Frost-Lang Operation. H. F. Hansell, Philadelphia.—p. 943.
Relation of Neurology to General Medicine. J. W. McConnell, Philadelphia.—p. 944.
Roentgen-Ray Diagnosis. J. W. Shuman, Sioux City, Iowa.—p. 946.
Spinal Subcutaneous Injections. S. Block, Brooklyn.—p. 949.

Secondary Nephrectomy.—Of twenty cases in which Chute did a secondary nephrectomy, nine were cases in which a primary nephrectomy had been done to lessen the danger to life from a subsequent nephrectomy. Seven of these nine patients presented a pyonephrosis; three due to renal stone; two of tuberculous origin and accompanied by perirenal abscess, and two nontuberculous; one of these patients also had a perinephritis abscess. There were also two large, acute hydronephroses, both in children, one the result of trauma, mildly infected, the other apparently of congenital origin. Of the nine patients subjected to secondary nephrectomy only one died. This was one of the tuberculous cases with a perirenal collection of pus, and as death did not take place until about six weeks after the secondary nephrectomy, it probably cannot be charged directly against the operation; there was no necropsy but death was supposed to have been due to a more or less generalized tuberculosis. Chute feels sure that had a primary nephrectomy been carried out on these nine patients the mortality would have been much greater than it

was; that the operation of secondary nephrectomy, in spite of its increased technical difficulties was really a conservative procedure for these patients. The remaining eleven cases represent a group in which Chute did not plan to do secondary nephrectomy but was forced to do it. Four of the patients in this group had had stones removed from their kidneys. Each had a urinary sinus in his loin that had existed for periods that varied from seven months to twenty years. Three additional cases in this group illustrate errors in diagnosis in connection with renal stones that led finally to secondary nephrectomies. Only one patient in this group died, a man with hypernephroma, on whom an unsuccessful attempt at removal had been made some months before.

Ohio State Medical Journal, Columbus

May 1, 1920, **16,** No. 5

Prevention and Treatment of Industrial and Traumatic Deformities. W. G. Stern, Cleveland.—p. 325.
Relative Value of Dry, Wet and Ointment Dressings for Wounds. C. T. Souther, Cincinnati.—p. 333.
Birth of Large Children. M. A. Tate, Cincinnati.—p. 336.
Coloboma and So-Called Congenital Dislocation of Lens. C. F. Clark, Columbus.—p. 338.
Cases Presenting Indications for Bronchoscopy; Complications Incident to Operation. T. Hubbard, Toledo.—p. 343.
*Sarcoma of Cerebellum; Report of Case. P. J. Steuber, Lima.—p. 349.
Intermediary Operation After Childbirth and Its Technic. J. L. Bubis, Cleveland.—p. 354.
Some Phases of Rural Health Problems. J. C. Larkin, Hillsboro.—p. 356.
Venereal Diseases as Problem of Preventive Medicine. J. M. Shapiro, Haifa, Palestine.—p. 358.

Sarcoma of Cerebellum.—Steuber's patient was only 8 years of age. He was under observation for one year. At the necropsy the cerebellum presented on section a sharply circumscribed, necrotic, caseated mass, replacing practically all the entire vermis, and extending well out into the cerebellar hemispheres, leaving only a small capsule of cerebellar structure varying in width from a few millimeters to 2 centimeters. The pathologic diagnosis was small round cell sarcoma.

Psychobiology, Baltimore

April, 1920, **2,** No. 2

Relative Stimulating Efficiency of Continuous and Intermittent Light in Vanessa Antiopa. W. L. Dolley, Jr., Ashland, Va.—p. 137.
Relation of Phototropism to Swarming in Honey Bee, Apis Mellifera L. D. E. Minnich, Cambridge, Mass.—p. 177.

Public Health Journal, Toronto

April, 1920, **11,** No. 4

Peace-Time Program of Red Cross Society. J. G. Fitzgerald, Toronto.—p. 149.
Syphilis and Gonorrhoea from Public Health Point of View. R. R. McClenahan, Toronto.—p. 177.
Plan for More Effective Federal and State Health Administration. F. L. Hoffmann, Newark, N. J.—p. 181.

Rhode Island Medical Journal, Providence

April 1, 1920, **3,** No. 4

Clinical Neuropathology; Value in General Practice. F. J. Farnell, Providence.—p. 64.
Need of Mental Hygiene in Rhode Island. A. H. Ruggles, Providence.—p. 68.
Education and Recreation in the Army. W. G. Haan, U. S. Army.—p. 71.

May, 1920, **3,** No. 5

Analysis of One Hundred Deaths from Diphtheria. D. L. Richardson, Providence.—p. 87.
Posterior Positions of Occiput. H. G. Partridge, Providence.—p. 93.

South Carolina Medical Ass'n Journal, Greenville

April, 1920, **16,** No. 4

Gallbladder Surgery. A. E. Baker, Charleston.—p. 95.
Hyperthyroidism. C. M. Rakestraw, Chester.—p. 97.

May, 1920, **16,** No. 5

Basal Metabolism in Hyperthyroidism. S. McGuire, Richmond.—p. 107.
Federal and State Program for Control of Venereal Diseases. C. V. Akin, Washington, D. C.—p. 120.

Southern Medical Journal, Birmingham, Ala.

May, 1920, **13,** No. 5

Comparison of Tests of Renal Function. C. W. Dowden, Louisville.—p. 305.
Acute Ascites. J. B. Guthrie, New Orleans.—p. 313.
Sippy Treatment of Peptic Ulcer. J. Friedenwald and T. H. Morrison, Baltimore.—p. 318.
Prognosis of General Paralysis of Insane. E. W. Fell, Cincinnati.—p. 326.
Acute Infections of Childhood. R. M. Pollitzer, Charleston, S. C.—p. 329.
Work of Public Health Service in Care and Treatment of Sick and Disabled Persons Discharged from Military Service. C. H. Lavinder, Washington, D. C.—p. 335.
Malaria Control Through Application of Antimosquito Measures: Results Obtained in Southeast Arkansas. H. A. Taylor, Mound, La.—p. 339.
*Malignant Moles. H. H. Hazen, Washington, D. C.—p. 345.
Pre-Cancerous Lesions of Breast with Special Reference to Chronic Cystic Mastitis. J. S. Rodman, Philadelphia.—p. 348.
Benign Tumors of Breast. J. S. Horsley, Richmond, Va.—p. 356.
*Importance of Early Diagnosis in Circulatory Disturbances of Extremities. B. M. Bernheim, Baltimore.—p. 365.
Operative Treatment of Pelvic Inflammation. C. R. Robins, Richmond, Va.—p. 368.
Report of Eye Cases. H. H. Martin, Savannah, Ga.—p. 373.
Unusual Eye Cases. T. McDavitt, St. Paul.—p. 377.
Trend of Modern Medical Education. W. W. Herrick, New York.—p. 381.

Malignant Moles.—This paper was abstracted in THE JOURNAL, Dec. 6, 1919, p. 1796.

Early Diagnosis of Circulatory Changes in Extremities.—Bernheim suggests that physicians might well direct a little more attention to a study of circulatory changes in the extremities. If a patient complains of cold feet, pain in the feet, especially if the pain is sufficient to keep him awake at night, the state of the circulation ought to be investigated, instead of dismissing the subject with a snap diagnosis of neuritis. Neuritis it is, of course. There is most likely an inflammatory process going on in the nerves, but it is of the degenerative type and due to a lack of blood supply, an ischemia. It is an ischemic pain, a pain that is cumulative in its effect and one that is most difficult to relieve. Indeed, the pain is but the outward expression, the earliest perhaps, of blood vessel changes which become more and more profound as time goes on, until finally there is a collapse from which recovery is not possible.

Southwest Journal of Med. and Surg., El Reno, Okla.

March, 1920, **28,** No. 3

Effectiveness of Neurosurgical Procedures. E. Sachs, St. Louis.—p. 50.
Trachoma. L. H. Buxton, Oklahoma City.—p. 56.
Bone Transplantation. B. Brooks, St. Louis.—p. 59.

Southwestern Medicine, El Paso, Texas

April, 1920, **4,** No. 4

Eggleston Method of Digitalis Therapy; Case Report. D. N. Shulman, Tucson, Ariz.—p. 1.
Blastomycetes. Report of Case. G. Werley, El Paso, Texas.—p. 4.
Nitrous Oxid and Oxygen Anesthesia in General Surgery. F. O. Barrett, El Paso, Texas.—p. 9.

Tennessee State Medical Ass'n Journal, Nashville

April, 1920, **12,** No. 12

Surgery and Roentgen Rays in Malignancy. W. A. Bryan, Nashville.—p. 433.
Vacuum Frontal Sinusitis. L. Levy, Memphis.—p. 435.
Post War Physician. H. R. Fairfax, Bristol.—p. 436.
Birth and Death Registration. H. L. Baugh, Nashville.—p. 439.
Educating Patient in Treatment of Gastro-Intestinal Diseases. S. Harris, Birmingham.—p. 440.
Municipal Narcotic Dispensaries. S. D. Hubbard, New York.—p. 445.
Lethargic Encephalitis. S. S. Crockett, Nashville.—p. 447.

Virginia Medical Monthly, Richmond

April, 1920, **47,** No. 1

Roentgen Rays in Treatment of Menstrual Disorders. J. W. Hunter, Norfolk.—p. 1.
Treatment of Menorrhagia with Radium. S. W. Budd, Richmond.—p. 5.
Symptoms and Signs Suggesting Possibility of Syphilis, Observed in Routine Examinations. J. D. Willis, Roanoke.—p. 9.
Importance of Routine Bacteriologic Studies in Eye Diseases. E. Hill, Richmond.—p. 12.
Traumatic Rupture of Diaphragm with Hernia of Stomach, Spleen and Transverse Colon into Left Pleural Cavity, and Communicated Fracture of Fourth Lumbar Vertebra. S. S. Gale, Roanoke.—p. 16.
Chronic Knee Strains. H. P. Mauck, Richmond.—p. 18.
Spontaneous Rupture of Uterus. Case Report. M. P. Rucker, Richmond.—p. 21.
Hyperthyroidism. C. M. Rakestraw, Chester.—p. 24.
Removal of Morbid Fears and Similar Besetments: Illustrative Cases. T. A. Williams, Washington, D. C.—p. 25.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Tropical Medicine and Parasitology, Liverpool

March 15, 1920, **13**, No. 4

Mechanism of Spontaneous Elimination of Yellow Fever from Endemic Centers. H. R. Carper.—p. 299.
*Metabolism of White Races Living in Tropics. Influence of External Temperature and Rate of Cooling on Respiratory Metabolism. W. J. Young.—p. 313.
Hypopus of Carpoglyphus Anonymus, Haller. H. M. Morris.—p. 339.
*Xerophthalmia in Native of Gold Coast. J. W. S. Macfie.—p. 343.
*Effect of Malaria in Leukemia. J. W. S Macfie.—p. 347.
Tropical Australia and Its Settlement. A. Breinl and W. J. Young.—p. 351.
*Experimental Infection in England of Anopheles Plumbeus, Stephens, and Anopheles Bifurcatus, L., with Plasmodium Vivax. B. Blacklock and H. F. Carter.—p. 413.
Anopheles (Coelodiazesis) Plumbeus, Stephens; Its Breeding-Places, Occurrence in Liverpool District, and Possible Connection with Spread of Malaria. B. Blacklock and H. F. Carter.—p. 421.
Description of Male Genital Armatures of British Anopheline Mosquitoes. H. F. Carter.—p. 453.
Human Trypanosomiasis in Peru (T. Escomeli). W. Yorke.—p. 459.

Metabolism of White Races in Tropics.—During the hot season of the year a greater metabolism was observed by Young than in the cooler season, excepting on certain days in the latter, when the rate of cooling was sufficiently great to cause the subject to shiver. This greater metabolism is attributed to the effects of the ordinary activities of everyday life which had preceded the actual experiment, which in the hot, moist weather produce a greater increase in body temperature, and consequently in the metabolism, than in the cool season. These effects also are reduced much more slowly during the hot season, when the cooling power of the atmosphere is low, than during the cool weather when the cooling power is much greater. The effects of such conditions prior to the actual measurement have thus a larger influence on the level of metabolism in the hot season. With tropical heat the metabolism is at a high level on account of the increase in body temperature produced by even slight exertion, and which decreases only very gradually after the exertion has ceased. Cold may also increase the metabolism but by producing shivering and so increasing the muscular activity.

Xerophthalmia.—Attempts to reproduce the disease in animals, by means of the bacillus obtained from a case of this disease, were unsuccessful.

Effect of Malaria in Leukemia.—In myelogenous leukemia as in lymphatic leukemia, a notable reduction in the number of leukocytes concides with the appearance in the blood of malaria parasites. This reduction is not permanent, and is rapidly effaced by treatment with quinin.

Experimental Anopheles Infection.—Blacklock and Carter have been able to infect laboratory-bred *Anopheles plumbeus* with *Plasmodium vivax*. At 28 C. infections of the gut and salivary glands were obtained; at room temperature (maximum 26 C., minimum 17 C.) gut infection only was obtained. They have also produced infection of the gut with *P. vivax* in the case of *A. bifurcatus* at 28 C. This is the first experimental evidence produced that *A. plumbeus* is capable of becoming infected with a malaria parasite.

Bristol Medico-Chirurgical Journal

March, 1920, **37**, No. 138

Queen Elizabeth's Academy. L. M. Griffiths.—p. 1.
Applications of Physiology to Medicine. G. A. Buckmaster.—p. 7.
Modern Treatment of Tuberculosis of Spine. A. Rendle Short.—p. 19.
Cases of Lethargic Encephalitis in Bristol. D. S. Davies, J. O. Symes, F. H. Edeworth, I Walker Hall and J. A. Nixon.—p. 25

British Journal of Tuberculosis, London

April, 1920, **14**, No. 2

*Care of Tuberculous Children: Treatment at Treloar Cripples' Hospital, Alton. H. Gauvain.—p. 49.
Infection and Predisposition in Tuberculosis: Summary of Some Views Held During Last Hundred Years. S. Delépine.—p. 60.
Criticism of London Scheme for Prevention of Tuberculosis. G. H. Dart.—p. 64.
Discharged Soldier and Sanatorium Treatment. G. B. Dixon.—p. 67.

Treatment of Tuberculosis.—The chemotherapeutic treatment of Ellis consisting of the use of an unstable brass compound, combined with picric acid, has been tested clinically at Alton with promising results in suitably selected cases. Hitherto its value has been most apparent in certain types of lupus, particularly when heliotherapy has been simultaneously applied. Further investigation is proceeding. Gauvain does not attach the importance to the sun cure ascribed to it by Rollier and other enthusiasts although it is a useful aid to treatment in many cases, and its psychological effect is remarkable.

Predisposition in Tuberculosis.—In Delépine's opinion it is better to attach too little than too much importance to the determining influence of predisposition. Tuberculosis can be controlled permanently only by taking comprehensive and thorough measures against infection, but in doing so one must keep in mind that there are predisposing circumstances which call for special measures. It is also important to distinguish between latent or occult and manifest disease. Finally, it must always be remembered that, accidentally or not, several factors generally act concurrently, and that their relative importance varies according to circumstances.

British Medical Journal, London

May 15, 1920, No. 3098

*Nutrition of Articular Cartilage. T. S. P. Strangeways.—p. 661.
Use of Polarized Light in Detection and Investigation of Suture Materials Embedded in Tissues. M. J. Stewart.—p. 663.
Gall Stones. R. P. Rowlands.—p. 665.
Air-Way Infections. Tfl H. C. Benians.—p. 668.
*Loewi's Epinephrin Mydriasis as Sign of Pancreatic Insufficiency. W. L. Cockcroft.—p. 669.
Vagasthenia. J. A. W. Watts.—p. 669.
Acute Suffocative Catarrh. J. A. Smyth.—p. 670.

Nutrition of Articular Cartilage.—Strangeway's studies show that the articular cartilage of the joints may derive some, if not the greater part, of its nourishment from the synovial fluid. If this hypothesis is true, then the changes which are found in the degenerative types of arthritis can also be explained. The primary cause of these degenerative types will be found not in the cartilage or bone, but in changes in the nutritive value of the synovial fluid. There is evidence that changes in the nutritive value of the synovial fluid may be due to changes in the vessels of the capsule of the affected joints.

Loewi's Test in Pancreatic Disease.—In one case reported by Cockcroft this sign was negative on three occasions; 2 drops of the adrenalin chlorid brand of epinephrin solution (1:1,000) were dropped into one eye. After one hour there was no reaction, the pupils remaining exactly equal. The jaundice was found to be due to carcinoma of the bile ducts with secondary growths in the liver. Suppurative cholangitis was also present. The pancreas was nowhere invaded by the growth, nor were there any secondary deposits in it, the gland itself being quite healthy. In a second case the test was positive; marked dilatation of the pupil appeared after one hour. At the postmortem examination, there was found to be malignant disease of the head of the pancreas, which invaded the duodenum and common bile duct. There were metastases in the liver, and obstruction and dilatation of the common bile duct and bile passages. The growth in the pancreas caused stenosis of the duodenum, with secondary dilatation and hypertrophy of the stomach and upper part of the duodenum.

China Medical Journal, Shanghai

March, 1920, **34**, No. 2

Study of Thirty-five Cases of Typhoid and Paratyphoid. H. J. Smyly.—p. 109.
*Unusual Pathologic Conditions of Intestines. R. H. Mole.—p. 115.
*Cancer in Hainan: Statistical Study of 131 Operations. N. Bercovitz.—p. 119.
Cases of General Paresis in China. J. L. Harvey.—p. 123.
Surgical Gleanings from War Experience. E. W. Kirk.—p. 131.
Dystrophia Adiposa Genitalis: Report of Case. G. D. Whyte.—p. 139.
Case of Cretinism. W. G. Lennox.—p. 140.
Surgical Hints to Young Medical Missionaries. C. C. Elliott.—p. 144.

Intestinal Cases.—The cases cited by Mole were as follows: (1) Almost complete obstruction of the rectum, due to

dysentery; (2) a ringed ulceration of the ileum, 2 inches from the ileocecal junction, causing complete intestinal obstruction; (3) extensive ulceration of the large intestine in a case of pulmonary phthisis; (4) extensive thrombosis of the mesenteric veins in a case of cholera.

Cancer in Hainan.—It appears from Bercovitz's study that cancer in Hainan is as much a disease of the early decades of life as of the later, for which no reason can be assigned. Cancer of the penis and glands of the neck is unusually frequent; for the former an old primary sore may be the etiologic factor; for the latter no reason can be assigned. Cancer of the exposed surface of the body is very common. Inasmuch as in most cases these people wear a scanty amount of clothing, the arms, trunk and legs of men who work the fields being bare, the rays of the sun may be a contributing factor. But it is rather more likely that large ulcers, treated in the native fashion, and the sores resulting from counter irritation as practiced by the Chinese, are the etiological factors. This is all the more probable in view of the tendency to keloid formation and the universal infection of wounds. Cancer of the stomach is infrequent. The absence of certain virulent streptococcic infections which are responsible for gastric ulcer may have something to do with this; or it may be that in this case, as in cancer of the uterus, the surgeon has not seen the cases. Cancer of the uterus is infrequent. It may be that these cases have not been seen by the physician, but it seems rather suggestive that the virulent infections of the female generative organs seem to be infrequent here.

Indian Medical Gazette, Calcutta

March, 1920, **55**, No. 3

Epidemic Encephalitis. L. P. Stephen and K. M. Bulchandani.—p. 81.
Actual Weight of Cataractous Lens; Clinical Notes on Cataract. A. E. J. Lister.—p. 84.
Kala-Azar In Europeans in Nowgong District of Assam. J. Dodds-Price.—p. 87.
Influenza in Sambhu Nath Pundit Hospital, Calcutta. D. N. Sen.—p. 89.
Work of Meiktila Vaccine Depot. J. Entrican.—p. 92.
Basrah Oil Fuel Refuse Destructor. G. R. Oberai.—p. 97.

Kitasato Archives of Experimental Medicine, Tokyo

December, 1919, **3**, No. 3

Study of Spirochaeta Morsus-Muris in Nippon Field Vole (Microtus Montebelli). R. Kobayashi and M. Kodama.—p. 199.
*Spirochete-Like Bodies Appearing in Culture of Certain Species of Bacteria. G. Koga and I. Otsubo.—p. 207.
Origin of D-Lactic Acid in Animal Organism. K. Taguchi.—p. 223.
*Early Treatment of Tuberculosis by Protective Immunization. K. Shiga.—p. 239.

Studies on Bacillus Mallei.—Koga and Otsubo have proved by cultivation that *Bacillus mallei* has flagella and produces spiral bodies. These spirochete-like bodies seem to be an abnormal development of either bacillary bodies or, more probably, the flagella in a certain condition. They bear close resemblance to the involuted form of *Treponema macrodentium* described by Noguchi.

Vaccine Therapy of Tuberculosis.—The results obtained by Shiga from the use of his T. B. serovaccine as an immunizing agent in the treatment of 300 cases of pulmonary tuberculosis have been very gratifying to him. Nutrition was improved markedly, the patient gained in weight and the symptoms of slight fever and lung sounds disappeared completely. Patients seen four years after cessation of treatment were still well. This vaccine was also used after the cessation of a pleurisy, following extirpation of tuberculous kidneys and testes. Dilutions of from 1:20 to 1:5,000 were used in doses varying from 0.1 to 0.8 c.c.

Lancet, London

May 15, 1920, **1**, No. 5046

Ambulatory Treatment of Fracture of Limbs; Tuberculous and Arthritic Disease of Joints. C. A. Hoefftcke.—p. 1042.
Rev. John Ward and Medicine. D'Arcy Power.—p. 1043.
Bone Grafting in Treatment of Fractures? E. W. H. Groves.—p. 1048.
Resection of Tibia with Grafting. L. E. B. Ward.—p. 1055.
*Infections of Hand. H. W. L. Molesworth.—p. 1055.
Specificity and Evolution in Disease. W. J. Collins.—p. 1059.
*Gastrocolic Fistula. D. Firth.—p. 1061.

Infections of Hand.—Analysis of 168 cases by Molesworth showed that hand infections in working people are too frequently the cause of grave disability. The time to treat these conditions efficiently is in their early stages. When tendon sheaths, etc., have become infected the hope of a useful finger is a thing of the past; the object of treatment then becomes to save whole hands, forearms and even lives. The outlook of the profession toward hands is much the same as it was toward the appendix twenty years ago. If localized tenderness became the danger signal in the hand, as it has become in the abdomen, and if suppuration in the hand, however small the area involved, were regarded as an indication for immediate operation, Molesworth says the morbidity of infected hands would fall in much the same way as the mortality of infected appendices has fallen.

Gastrocolic Fistula.—In the case recorded by Firth, a correct diagnosis was not made. The past history was indefinite, the patient had undergone no operation, and two of the most characteristic symptoms, diarrhea and vomiting, subsided on admission to hospital, so that no opportunity occurred to investigate their nature. The patient died. Firth discusses in detail a combination of symptoms which should arouse a suspicion of the existence of a gastrocolic fistula.

Medical Journal of Australia, Sydney

April 3, 1920, **1**, No. 14

Fracture-Dislocation of Cervical Spine in a Child. J. G. Edwards.—p. 311.
Case of Suppurating Hydatid of Liver with Multiple Abscesses: Recovery. C. Gordon Shaw.—p. 311.

April 10, 1920, **1**, No. 15

Surgical Shock. V. Hurley.—p. 331.
Plea for Standard of Cure in Cases of Gonorrhoeal Urethritis in the Male. V. N. B. Willis.—p. 336.
Cholecystitis in a Patient with Transposition of Viscera. G. Bell and R. C. Winn.—p. 339.

Practitioner, London

April, 1920, **104**, No. 4

Medicolegal Notes. J. Collie.—p. 241.
Medical Notes. T. Horder.—p. 246.
Recent Public Health Work. J. Priestley.—p. 249.
Therapeutic Measures in Influenza. G. E. Beaumont.—p. 263.
*Splenomegaly and Jaundice; Splenectomy. A. A. McConnell.—p. 278.
Lethargic Encephalitis. A. Howell.—p. 290.
*Syringing Ears. T. B. Layton.—p. 299.
Maladies and Medicines. A. Campbell.—p. 305.
Ascaris Lumbricoides as Cause of Urgent Symptoms in Disease Among Children. C. Pentland.—p. 313.

Splenectomy in Splenomegaly and Jaundice.—In a case of Hanot's cirrhosis without enlargement of the liver, McConnell did a splenectomy. He says that if there is any evidence that the liver is involved secondarily to the spleen, or if the spleen is a factor in the causation or an adjuvant to the course of hepatic cirrhosis, splenectomy is indicated. His patient did very well for thirty-six hours, when she suddenly vomited a large amount of blood. Her pulse became imperceptible. Twelve hours later she vomited more blood, and died shortly afterward. The postmortem report showed that the stomach and duodenum were full of blood without any lesion whatever of their walls. This gastric hemorrhage was undoubtedly the cause of death and was in all probability due to the advanced cirrhotic state of the liver.

Syringing Ears.—Two rules are laid down by Layton: First, that water at the body temperature must be used; second, that for wax the syringing must be done hard, and for pus it must be done gently. To each of these rules there is an exception: to the first when the observer wishes to produce giddiness to test the function of the vestibular nerve; to the second when the patient has earache, and may have an acute otitis media, or other painful lesion, beneath the plug of wax.

Tubercle, London

April, 920, **1**, No. 7

Thoracoplasty in Treatment of Pulmonary Tuberculosis. C. Saugman.—p. 305.
Tuberculosis Care Work. Z. P. Fernandez.—p. 317.

May, 1920, **2**, No. 8

*Traumatic Pulmonary Tuberculosis. J. B. McDougall.—p. 353.
Von Pirquet Investigations in a Parish without a Notified Death from Tuberculosis. E. Bjorn-Hansen.—p. 359.

Traumatic Pulmonary Tuberculosis.—In only two cases among 139 cases of gunshot wounds of the chest investigated by McDougall was there a history of former pleurisy or tuberculosis of the lungs. In the severe types of wound seen four or five days after infliction of the injury, it was scarcely possible to make a positive diagnosis of tuberculosis from the physical signs present. In four cases a tuberculous infiltration was suspected clinically, and was corroborated by the roentgen ray. Tubercle bacilli were not found in the sputum in any cases.

Annales de Médecine, Paris

January, 1920, **6**, No. 6

*Tumor of Spinal Meninges. C. Roubier and P. Brette.—p. 433.
*General Paresis Among Arabs. A. Porot and N. Sengès.—p. 444.
*Sequelae of Rachitis in Adults. A. Léri and T. Beck.—p. 449.
*Gland Extracts in Differential Diagnosis. R. Porak.—p. 469.

Tumor of Spinal Meninges.—The woman of 48 complained for six or seven months of pains in the neck and left arm. Then came spastic paraplegia and amyotrophic paresis of the smaller muscles of the hands, predominant on the left. Finally sphincter and trophic disturbances ushered in the terminal phase. The pains throughout the whole year's course were so severe that morphin was required almost daily. Nothing but compression from a tumor could explain the sequence of events, and necropsy revealed a small subdural myxosarcoma, not adherent to cord or meninges, but its anterior position would have rendered access to it extremely difficult.

General Paresis Among Arabs.—The total absence of general paresis among Arab syphilitics has long attracted attention. Not even the stress of years of service at the front brought any tendency to general paresis among the Arab troops. Porot and Sengès relate that in their experience at Alger, notwithstanding the extreme prevalence of syphilis, they have never encountered but one instance of general paresis, and this was of such a mild form that the Arab officer was able to serve for more than three years at the front, and the necropsy findings were meager.

Rachitic Adults.—Léri and Beck draw the composite picture of what they call *les petits rachitiques* from study of twenty-two such cases and forty suspects. In ordinary life there is nothing to suggest that they are not normal except that the legs are rather short, with tendency to genu varum; the teeth are irregular; the root of the nose is somewhat sunken; the nostrils wide and the mentality is backward. Under physical or mental strain their bones soon begin to ache and they whine and complain, and are listless and inert, striving to avoid every effort, even the effort of speaking clearly. This inertia during military service brought some of these men up for discipline, as they simply refused to get up when ordered, wishing to be left alone, while their statements as to their bones aching were so vague that they were not believed. This pathologic type is usually misunderstood. Such persons need peace and quiet, and they should be advised to live in the country, although even here they are liable to break down during periods of extra work, harvesting, etc. Ordinary treatment for rheumatism is of no benefit; rest is what they need until they can reassemble their forces enough for tranquil living.

Gland Extracts for Differential Diagnosis.—Porak has been studying for some years the response to thyroid, pituitary and other gland extracts in health and in disease. The difference in the reaction is often so marked as to aid in differential diagnosis. Suprarenal extract and thyroid extract in the healthy display an immediate pressure reducing and pulse slowing action, but with myxedema nothing of the kind occurs, or it is very slight, or the effect may be the reverse, the pulse becoming accelerated. In one girl of 10 with a white swelling of the knee and tendency to obesity, no effect was apparent from test administration of thyroid extract. This confirmed the suspicion of myxedema, and under regular and continuous thyroid treatment improvement was soon observed; in ten days the weight dropped from 34.3 kg. to 30. Pituitary extract accelerates the pulse in myxedema and slows it in the normal, while it causes the pulse to grow slower from the oculocardiac reflex in myxedema. The test is made with intramuscular injection of 0.5 to 2 c.c. of thyroid extract or pituitary extract. In seven tests with suprarenal extract the blood pressure was not raised as high or as long in myxedema as in the healthy except when the myxedematous were taking thyroid treatment, in which case the response was about the same as in the healthy.

Archives de Médecine des Enfants, Paris

May, 1920, **23**, No. 5

Congenital Deformity of Bones. E. Apert and Cambessédès.—p. 265.
Physical and Mental Condition of the Schoolchildren in the Evacuated Districts. G. Heuyer.—p. 273.
Permanent Congenital Cyanosis; Four Cases. Variot and Bouquier.—p. 292.
*Meningococcus Arthritis. P. Nobécourt and J. Paraf.—p. 297.
*Nodding Spasm in Children. J. Comby.—p. 303.

Meningococcus Arthritis in Infant.—Nobécourt and Paraf warn that arthritis in an infant should suggest the meningococcus. In the case reported the left ankle was the only joint involved. The child had been having slight fever for four days. There were no symptoms of meningitis but lumbar puncture was done nevertheless, and meningococci were found in the fluid. No improvement followed vigorous antiserum and vaccine treatment, which included injection of the antiserum directly into the ventricle. Necropsy disclosed an abscess deep in the brain, communicating with the ventricle by a minute opening.

Head Shaking in Children.—Comby compares recent works on nodding spasm with Herrman's report of sixty-four cases of what he calls head shaking with nystagmus in infants. The treatment, Comby reiterates, should be by hygiene alone, avoidance of every kind of nervous excitement and of sedatives such as bromids, belladonna and arsenic. Children with a tendency to rachitis should be given phosphorus and cod liver oil.

Bulletin de l'Académie de Médecine, Paris

April 20, 1920, **83**, No. 16

*The Contents of the Fasting Stomach. L. Pron.—p. 361.
The Murderous Capacity of Heavy Artillery. R. Mercier.—p. 363.
*Virus of Epidemic Encephalitis. C. Levaditi and P. Harvier.—p. 365.
*Congenital Dislocation of the Hip Joint. Calot.—p. 367.

Analysis of the Fasting Stomach Content.—Pron declares that sometimes analysis of the content of the fasting stomach is the only means to distinguish between ulcer and simple hyperchlorhydria, to detect the secondary nature of certain stomach disturbances with liver disease, and to diagnose catarrh. He was impressed with the infrequency of retention of food in the fasting stomach; this was evident only in 7 per cent. of his 500 cases, and it could be detected only with the microscope in 14 of these 35 cases. He first tests for the splashing sound, and found frank acid catarrh in 64 per cent.; acid catarrh without free hydrochloric acid but considerable fermentation acids in 85 cases; pure mucous catarrh, without free hydrochloric acid and blood in 29, and a catarrhal condition with transudation of serum and chlorids from the blood in 5. In 24 cases pure bile was found.

The Virus of Epidemic Encephalitis.—Levaditi and Harvier report the successful inoculation of a rabbit with virus from the cortex, midbrain and medulla of a patient with lethargic encephalitis. The rabbit showed similar lesions in the nervous system and they could be reproduced in other rabbits by inoculation in the sciatic nerve or anterior chamber of the eye. Virus from the clinical case did not prove pathogenic for the monkey and guinea-pig until after passage through the rabbit. The virus is filtrable and can be kept in glycerin or desiccated, and can be refound in the spinal cord of animals inoculated in the brain. Convalescents' serum has no neutralizing action on it.

Treatment of Congenital Luxation of the Hip Joint.—Calot declares that roentgenologic study of several thousand cases of congenital luxation of the hip joint has shown that some of the prevailing conceptions are erroneous. Treatment based on the information thus derived has amply demonstrated, he says, the importance of the new data thus learned. The primitive acetabulum in very young children belongs more to the ischium than to the ilium, and the head and neck of

the femur should be kept in a horizontal instead of a slanting position during the entire treatment. The thigh should be flexed to the extreme in the first cast. By these means we can obtain a large and stout horizontal cavity which will retain the head of the femur in this rediscovered primitive acetabulum. To prevent any adhesion between the head and its bed, he applies three plaster casts instead of leaving one on for the entire eight or twelve months. The flexion is slightly modified in the three casts, from 1½ right angle in the first to 1 in the second and ½ right angle in the third.

Bulletins de la Société Médicale des Hôpitaux, Paris

March 12, 1920, **44**, No. 10

Sex as Factor in Certain Infectious Diseases. J. Comby.—p. 353.
Epidemic Encephalitis. J. Comby and others.—p. 355, 357, 359, 382, 384.
*Spastic or Mental Torticollis. P. Marie and A. Léri.—p. 359.
*Congenital and Familial Ophthalmoplegia. Crouzon and Béhague. —p. 372.
Curable Meningeal Episodes in the Course of Chronic Pulmonary Tuberculosis. de Massary and Léchelle.—p. 377.
Adequate Doses of Diphtheria Antitoxin. P. F. Armand-Delille.—p. 380.

Vertebral Lesions and Torticollis.—Marie and Léri give the details of seven cases of what is called mental torticollis as the head can be passively straightened. In each case stereoscopic roentgenograms showed irregular outlines of the vertebrae in the neck, excrescences and hooks like those seen in chronic rheumatism of the spine.

Congenital and Familial Ophthalmoplegia.—Crouzon and Béhague describe a family in which there were from one to three members with pronounced ophthalmoplegia in each of three generations.

Paris Médical, Paris

April 10, 1920, **10**, No. 15

*Surgical Intervention in Dysentery. J. Leveuf and Heuyer.—p. 301.
Neuropathic Lethargic Pseudo-Encephalitis. Roger and Chaix.—p. 308.
Fracture of Ulna with Luxation of Radius. Dujarier and Mathieu —p. 311.

Surgical Intervention in Grave Forms of Dysentery.—Leveuf and Heuyer observed in Albania, in 1917 and 1918, 700 cases of dysentery that came directly from the front. Among these there were 49 deaths, or 7 per cent. This percentage might be larger if the deaths of soldiers after evacuation from the service could be included. In Prussia in 1917 there were 7,076 deaths in 58,196 cases, a mortality rate of 12 per cent. Their success with cecostomy in saving 6 in 10 extremely severe cases with tender colon and rapid aggravation of the general condition should encourage, they say, earlier operative intervention in both acute and chronic dysentery. By opening up the cecum amply, the feces are diverted away from the diseased mucosa, while it allows direct medication of the intestine walls. They operated between the eighteenth and the twenty-fifth days and found the cecostomy a comparatively mild intervention while it protected against hemorrhage and perforation, and allowed the patients to be amply fed.

Presse Médicale, Paris

April 28, 1920, **28**, No. 26

*Pathogenesis of Migraine. P. Pagniez and A. Nast.—p. 253.
*Circulation of the Cerebrospinal Fluid. V. Stepleanu-Horbatsky (Bucharest).—p. 254.

Nature and Cure of Migraine.—Pagniez and Nast report further experiences which confirm the alimentary anaphylactic nature of migraine, and how it can be warded off by a small dose of peptone before meals, to desensitize. After concluding a course of peptone, one man who had been subject to migraine since childhood, could take chocolate with impunity for a certain time, but then a smaller amount brought on the migraine. It was preceded by certain changes in the blood, the *crise hémoclasique*. Repeated blood counts showed normal leukocytosis after ingestion of the chocolate in five tests at three or four days' intervals. The sixth test showed total absence of the digestive leukocytosis, and in a few hours the leukocytes dropped from 6,000 to 3,700, with other signs of the phase of hemolysis characteristic of anaphylaxis. Prophylactic treatment with the peptone is not always effectual in these alimentary anaphylactic reactions, but it should be given a trial, at least, as it often is temporarily and sometimes is permanently successful.

Circulation of the Cerebrospinal Fluid.—Four children from 9 months to 11 years old with grave gastro-enteritis or tuberculous meningitis were given an intraspinal injection of 1 c.c. of methylene blue in a 1:20 solution. The spread of the stain corresponded to our conceptions of the action of anesthetics injected intraspinally. The nerve roots were intensely stained but the spinal cord only on the surface. The stain evidently spread to the general circulation by way of the lymphatic glands. It reached the base of the brain and even the ventricles, and the presence of the stain in the jugular vein, cranial sinuses and venous plexuses of the skull testifies to the direct communication between the subarachnoid space and the venous system. The fluid is thus constantly and slowly passing from the center to the periphery, but there is no actual cycle of circulation.

Progrès Médical, Paris

April 17, 1920, **35**, No. 16

*Metastatic Cancer of Douglas Pouch and Rectum. A. Cade and C. Roubier.—p. 171.
Serofibrinous Pleurisy in Children. Hutinel.—p. 174.

Metastatic Cancer of Douglas' Pouch and Rectum.—Cade and Roubier report three cases of metastasis in the Douglas pouch and the rectum. The recognition of such metastases they regard of great diagnostic and prognostic importance. In the cases in which the primary cancer has not been recognized, the examination by palpation and rectoscopy will aid in excluding primary rectal cancer. As emphasized by Bensaude, if examination reveals the existence of an infiltration of the walls of the rectum, with no ulcerations of the mucosa nor proliferation, metastatic cancer of the rectum should be suspected, and the primary tumor should be sought for in the stomach. When the primary neoplasm has been diagnosed, the finding of the metastatic tumor will signify to the clinician that peritoneal generalization has taken place, while the surgeon will know that he must confine himself to a purely palliative operation or refrain from any intervention whatsoever.

Schweizerische medizinische Wochenschrift, Basel

April 15, 1920, **50**, No. 16

*Drainage of Congenital Hydrocephalus. E. Wieland.—p. 301.
Danger of Blindness after Loss of One Eye. E. Hegg.—p. 304.
*Rhizomelic Spondylosis in Girl. K. Schnyder.—p. 306.
Action of Drugs on the Intestines by Oral and by Parenteral Administration. F. Uhlmann and K. Zwick.—p. 308. Conc'n.

Spontaneous Drainage of Hydrocephalus.—Wieland relates that a 9 weeks' infant with congenital internal hydrocephalus of unknown origin suddenly developed polyuria; the weight dropped rapidly and the symptoms of pressure on the brain rapidly subsided. The fluid had forced its way through the brain substance which had been flattened out into a very thin layer at the top of the skull. The skull bones sank until the edges of the anterior fontanel overlapped. The fluid collected again soon, and after an attempt to trephine, the roentgenogram showed hydropneumocephalus, the cerebrum above as thin as paper. He compares the conditions with those of Goltz' decerebrated dog. The child drank vigorously from its bottle, cried and developed further, but is a spastic imbecile and blind. At the third month the parietal bones overlapped the frontal.

Rhizomelic Spondylosis.—Schnyder's case is unusual from the first appearance of the disease at the age of 9 or earlier in the girl, the involvement of the peripheral joints and the long failure to recognize the true nature of the disturbances. The girl is now 14.

Policlinico, Rome

April 5, 1920, **27**, No. 14

Cultivated Atropa Belladonna. G. Gaglio.—p. 403.
Extraperitoneal Appendicular Hernia. G. Mafera.—p. 404.
*Heliotherapy as Adjuvant to Quinin. G. Viale.—p. 406.
Kidney Disease and Accident Insurance. G. Dragotti.—p. 406.

Heliotherapy in Malaria.—Viale comments on the rapid improvement in six cases of long rebellious malaria when each time, after taking the dose of quinin, the nude trunk was exposed to the sunlight for several hours. This treatment was suggested, he says, by the reflection that quinin and methylene blue, the two drugs most effectual in malaria, are both fluorescent substances.

Riforma Medica, Naples

March 27, 1920, **36**, No. 13

Italian Mineral Waters in Dysentery. C. Fedeli.—p. 317.
Pathologic Anatomy of Lethargic Encephalitis. G. Tarozzi.—p. 320.
Psoriasis with Amenorrhea; Recovery Under Ovarian Treatment. G. Verrotti.—p. 321.
Acute Myoclonic Encephalitis and Dubini's Disease. A. Litvak.—p. 322.
*Placenta Implants. G. Romano.—p. 324.
Present Status of Colchicin. A. Jappelli.—p. 325.

Placenta Implants.—Romano implanted the whole placenta or a suspension of mashed placenta tissue in the peritoneal cavity of rats. The suspension was used in ten of the tests, and in all these rats some of the placenta elements invaded the lungs of the animals and multiplied there indefinitely, substituting the parenchyma of the lung, the animals dying sooner or later from asphyxia.

Rivista di Clinica Pediatrica, Florence

March, 1920, **18**, No. 3

*Mediastinal Tumors in Children. A. Lorenzini.—p. 129.
*Tumors of the Mesentery in Children. C. L. Rusca.—p. 159.
Recent Literature on Extrasystoles in Children. P. Busacchi.—p. 178.

Mediastinal Tumors in Children.—Lorenzini reports the case of a girl of 6 who for a month had presented symptoms suggesting left pleurisy with large effusion, but the left arm soon showed edema and the displacement of the heart toward the right was not modified by thoracentesis. About 8,000 c.c. of fluid were released by puncture repeated nine times in the course of the following six weeks before the child succumbed to asphyxia from the lymphosarcoma found in the mediastinum. The pains almost throughout had been restricted to the upper left abdomen. A dry spasmodic cough had been the first and for some time the only symptom. The temperature was constantly febrile. A systolic murmur was heard in the right hemithorax evidently due to compression of the pulmonary artery. In Siccardi's case, in an adult, 34,900 c.c. of fluid were evacuated by thoracentesis repeated seventeen times in one month. A list of references to articles on mediastinal tumors and pleural eosinophilia is appended.

Tumors of the Mesentery in Children.—Rusca's patient was a girl of 6 with signs of an abdominal tumor, not tender, and dubious response to the skin tuberculin test. There was eosinophilia of 14 per cent. but the stools were free from parasites, and there was no fever, no pain, and the general condition was constantly good. The tumor was in the mesentery of one of the first loops of the small intestine and a segment of the intestine with the mesentery involved were resected, with prompt recovery. It proved to be an echinococcus cyst and it might have been spontaneously absorbed later, but there would have been danger of rupture of the cyst and toxic action from its contents. Devé and Penna have reported fatalities from this cause.

Rivista Critica di Clinica Medica, Florence

Feb. 5, 1920, **21**, No. 4

*Protein Therapy in Colitis. A. Furno.—p. 37. Conc'n.

Dysenteriform Hemorrhagic Colitis.—In Furno's five cases there was evidently mild mixed infection, the colon bacillus predominating. From some unknown cause, possibly chilling, the virulence becomes exalted and treatment should aim to reenforce the natural defensive forces. For this he has found Nolf's proteose therapy remarkably effectual, that is, intravenous injections of 10 or 12 c.c. of 10 per cent. solution of peptone on alternate days. (Nolf described his method in THE JOURNAL, June 28, 1919, page 1901, and Nov. 22, 1919, p. 1579.) Furno emphasizes that by prompt resort to protein therapy the colitis is arrested before it reaches the ulcerative stage which may be as grave a condition as in typhoid. Vaccine therapy may answer the same purpose. The reaction to the peptone is sometimes intense but is harmless if properly managed.

Archivos Latino-Amer. de Pediatría, Buenos Aires

January-February, 1920, **14**, No. 1

*Acute Meningitis. L. Morquio.—p. 1.
*Psoitis from Inherited Syphilis. Martagao Gesteira.—p. 20.
The Cerebrospinal Fluid in Differential Diagnosis of Meningitis and Meningo-Encephalic Reactions. G. Aráoz Alfaro.—p. 28.
Organization of Bureau of Infant Hygiene in New York Health Department. Alicia Armand Ugón.—p. 55.

Acute Meningitis.—Morquio relates that in a recent two weeks he encountered 12 cases of tuberculous meningitis in children, 2 of pneumococcus and 4 of meningococcus meningitis, 2 following influenza and 1 otitis, and 1 with clear spinal fluid during life but necropsy revealed pus, a total of 22 cases in two week. With serotherapy the prognosis is losing its extreme gravity in other than tuberculous forms. Pneumococcus meningitis has usually a stormier and graver onset. One boy of 5 died in twelve hours. He has had cases in which everything seemed to indicate primary tuberculous meningitis but the progressive improvement and recovery eliminated this. This was particularly marked in some cases of meningitis following mumps, but in a case reported by Pelfort, two months after the mumps meningitis, actual tuberculous meningitis developed. Meningitis with poliomyelitis was always mild and promptly subsided in his experience. A syphilitic meningitis does not affect the general health so much; it may assume a chronic form with or without functional reactions; differentiation is particularly important with inherited syphilis. In the graver cases, he always found tuberculous meningitis superposed. Seicht was able to compile only 6 cases of acute syphilitic meningitis, and the diagnosis was made during life only in one of them. In one child an acute primary meningitis with slight leukocyte reaction, polynuclears predominating, subsided completely in less than ten days, but bacteriologic examination was constantly negative.

Syphilitic Psoitis.—Martagao calls attention to two children about 5 years old who both complained of pain and tenderness in the right flank suggesting appendicitis plus coxitis. The right leg was drawn up, abducted and rotated outward. There was no fever and the rapid onset seemed to exclude a tuberculous process. By exclusion, psoitis seemed the probable explanation of the symptoms and under specific treatment they promptly susided.

Revista Española de Medicina y Cirugía, Barcelona

January, 1920, **3**, No. 19

Operations on the Eyes. M. Márquez.—p. 1.
*Test for Formaldehyd in Milk. A. Gallego.—p. 10.
Disturbances in the Digestive Apparatus in the Tuberculous. F. Gallart y Monés.—p. 13. Conc'n.

Fuchsin Test for Formaldehyd in Milk.—Gallego recalls that formaldehyd modifies fuchsin, transforming its red to a violet and rendering it less soluble in water and alcohol. This property of formaldehyd is proving useful in histologic examinations, and the addition of ten drops of fuchsin to 10 c.c. of milk turns the milk pink and the tint deepens to violet in case the milk contains any formaldehyd even in the dilution of 1:100,000. This test is much simpler than Denigès' technic which is based on the recoloration of previously decolored fuchsin.

Revista Española de Obstet. y Ginecología, Madrid

January, 1920, **5**, No. 49

*Surgical Treatment of Prolapse of the Uterus. F. Botín.—p. 1.
Pneumonia in Advanced Pregnancy. J. Torre y Blanco.—p. 7.
Occipito-Posterior Presentation. Macías de Torres.—p. 11.

Prolapse of the Uterus.—Botín explains how insufficiency of any one of the different factors involved in sustaining the uterus modifies the indications for correction of prolapse, so that no one method of correction can be applied to all. But he has been quite successful with ventral fixation of the uterus by the Delbet method, and declares that the mishaps

with it that have been reported and repeated by the detractors of this technic seem to be more numerous than they really are, and in many cases the abortion, etc., would have occurred without the fixation. He refers to a number of his personal cases in which pregnancy later developed without complications, but he advises such patients to keep in bed for twenty-five or thirty days after delivery, taking small doses of ergot daily, and, after the tenth day, hot irrigation and gentle massage of the uterus to promote involution without detaching the uterus from its artificial attachment. Recurrence of the prolapse seems to be much less frequent than with other methods, he says.

Revista Médica del Uruguay, Montevideo

March, 1920, **23**, No. 3

*Gonococcus Arthritis. Aquiles di Lorenzo.—p. 121.
*Factitious Eruptive Disease. P. E. Duprat.—p. 123.
Influenza and its Prophylaxis. F. Paladino.—p. 130.
Bacteriology of Influenza. A. Prunell.—p. 141.

Gonococcus Arthritis.—The temporomaxillary articulation was the only one involved in the young woman. The arthritis was refractory to the usual local and vaginal treatment but improved under three weeks of vaccine therapy.

Factitious Eruptive Disease.—The puzzling "epidemic" that broke out in the penitentiary can only be explained, Duprat thinks, by some visitor having left some croton oil.

Mitteilungen a. d. med. Fak. d. kais. Univ., Tokyo

Aug. 28, 1919, **22**, No. 1. German Edition.

*Pathogenesis of Epitheliomas. IV. K. Yamagiwa and K. Ichikawa. —p. 1.
*The Interstitial Cells. M. Ishibasi.—p. 39.
*Fate of Morphin in Animal Body. I. K. Tamura.—p. 121.

Artificial Cancers.—THE JOURNAL has mentioned from time to time the success of Yamagiwa and Ichikawa in inducing the production of epitheliomas by painting the rabbit ear with tar. They here report similar research on the mammary gland. In 6 per cent. of 47 cases, repeated application of a tar-lanolin mixture was followed by changes in the tissues, as they show in ten handsome plates, which are of an unmistakable adenocancroid or carcinoma type. Their research is being continued with the aid of the Japanese Cancer Research Society and a special grant from the government. They say that they have never learned of an instance of spontaneous mammary cancer in rabbits. They injected subcutaneously 1 c.c. of the mixture of lanolin and an aqueous extract of tar, twice a month and later once a month, or the injection was made with 0.3 c.c. of pure tar directly into the mammary gland once a month. The rabbit with the adenocancroid cast four litters during the 463 days of the experiments.

The Interstitial Cells.—Ishibasi concludes his long study of the nature and purposes of the interstitial cells of the testicles with the statement that he was unable to detect any connection between the proportions of epithelial cells and the degree of development of the external sexual characteristics. The plates show the microscopic findings in these cells at different ages and in the rat under vital staining.

Fate of Morphin.—Tamura's research was mainly on the oxidation products of morphin and their action. The data presented seem to indicate that the paralyzing action of morphin is the work of the alkaloid itself, while the second phase, the stage of excitement, is the work of some product of its disintegration.

Berliner klinische Wochenschrift, Berlin

Dec. 29, 1919, **56**, No. 52

Sensitiveness of the Cornea. Goldscheider and Brückner.—p. 1225.
Street Car Fracture of the Humerus. Pawel.—p. 1231.
*Immunotherapy of Cancer. C. Lewin.—p. 1233.
*Effect of Digitalis on Diuresis. A. Jarisch.—p. 1235.

Autoserotherapy of Cancer.—Lewin relates his experience with autoserotherapy in the treatment of a woman, aged 44, who had been suffering for three years with various complications from cancer of the breast. In April, 1916, the right mamma had been amputated for carcinoma simplex. In 1917 a second operation was required, followed by roentgen-ray treatment. In April, 1918, when reexamined, vision of the right eye was almost gone, doubtless owing to cancerous metastases in the right orbit. From May 3 to May 15, 1918, the patient was given intensive roentgen-ray treatment, whereupon vision in the right eye improved and some of the nodules on the breast disappeared. In November, 1918, the nodules adjacent to the operation scar had returned, with ascites. Jan. 11, 1919, 3 liters of clear serous fluid were withdrawn from the abdominal cavity. In May, 1919, as the ascites was gradually increasing, treatment by autoserotherapy was begun. He aspirated 10 to 20 cm. of fluid from the abdominal cavity, and reinjected it under the abdominal skin. June 23, 1919, she was readmitted to the hospital, and received two or three injections of the fluid from the abdomen per week, from 15 to 20 cm. each, and at the same sitting the nodules were given roentgen-ray treatment. The nodules, in sharp contrast to their behavior following the preceding series of exposures, began to show a marked tendency to retrogress. July 15, 1919, 3½ liters were withdrawn from the abdominal cavity, part of the fluid being left in order to continue the autoserotherapy. After the puncture, several abdominal tumors, some as large as a fist, could be palpated. The patient continued to receive two injections weekly into September. The nodules gradually receded more and more, and the ascites showed no tendency to develop again. Gradually all symptoms disappeared. Nov. 26, 1919, the nodules on the breast and back had entirely retrogressed, leaving merely pigmented spots. The ascites had disappeared by October, and the tumors in the abdominal cavity had likewise completely receded. The right eye still protrudes, and is quite blind. No clinical trace of a carcinomatous disease process could be discovered then, and the appetite and general health were good as compared with the former condition. He has previously published a case of the kind in which the results were equally good from this autovaccination, and no roentgen exposures had been made.

Inhibitive Effect of Digitalis on Diuresis.—Jarisch reports two cases of syphilis of the aorta with insufficiency of the semilunar valves in the uncompensated stage, in which diuresis was inhibited by therapeutic doses of digitalis but was increased by very small doses. He thinks that owing to the increased excitability of the blood vessels of the kidney, the threshold for both the vasoconstricting and vasodilating effect of digitalis was reduced. As both patients had incipient contracted kidney, the conclusion may perhaps be drawn that overexcitability of the blood vessels of the kidney is characteristic of contracted kidney in the incipient stage. A second conclusion would be that in the presence of contracted kidney great caution should be observed in fixing doses of digitalis, and that small doses are to be preferred. In heart patients the same caution is required if the low specific gravity of the urine points to renal sclerosis.

Medizinische Klinik, Berlin

March 14, 1920, **16**, No. 11

*Operative Treatment of Duodenal Ulcer. Haberer.—p. 275.
Effect of Epinephrin on Blood. P. Schenk.—p. 279. To be cont'd.
*Sequels of Enterogenous Cholangeitis. A. Albu.—p. 282.
Rheumatoid Conditions with Eye Affections. Junius.—p. 283.
Relations Between the Vestibule and the Posterior Cranial Fossa. O. Fleischmann.—p. 288.

Operative Treatment of Duodenal Ulcer.—On the basis of 205 cases of duodenal ulcer observed during the course of his practice, Haberer gives his conclusions in regard to indications for operation. It is his experience that gastroenterostomy does not give very satisfactory results; several times after exclusion of the pylorus he was obliged to operate for peptic jejunal ulcer, so that he has come to regard this as a bad postoperative complication. Of late years he has been more and more inclined to resection of the duodenum, as with increasing experience and an improved technic the danger has been reduced to a minimum. He has performed 105 resections, 55 exclusions of the pylorus and 45 gastro-enterostomies for the relief of duodenal ulcer. In his first series, reported in 1918, he had 4 fatal cases out of 46 resections, a mortality rate of 8 per cent. In his second

series of 59 resections he has had only one fatal case, a mortality of under 2 per cent.

Sequels of Enterogenous Cholangeitis.—Albu states that cholecystitis in children and others under 20 years of age is not so rare as is commonly supposed, as he has had seventeen cases during the past five years. He therefore recommends that if children have protracted, severe pains in the stomach, especially if they suggest colic, even though no icterus is present, a possible pathologic condition of the gallbladder should be considered, as in order to prevent the development of chronic cholelithiasis in children the first attack of cholecystitis should be recognized and given proper treatment. One girl of 11 had a typical gallstone colic, with pains mainly in the liver region but spreading to stomach and back. After vigorous purging she voided a soft calculus, weighing 2 gm., which consisted entirely of cholesterin. She had complained for a few weeks of slight stomach disturbance, but has been entirely well since passage of the calculus.

Münchener medizinische Wochenschrift, Munich

March 19, 1920, **67**, No. 12

*Adiposis Dolorosa. E. Grafe.—p. 339.
Collargol by the Vein in Chronic Arthritis. A. Böttner.—p. 341.
*The Relative Size of the Heart. R. Geigel.—p. 343.
*Effect of Ultraviolet Rays on the Blood. K. Traugott.—p. 344.
*Meat from Tuberculous Cattle. M. Müller.—p. 349.
Improved Technic for Levaditi Silver Stain. J. Saphier.—p. 352.
Abortive Course in Case of Lethargic Encephalitis after Intralumbar Injection of Influenza Antiserum. Fendel.—p. 353.

Atypical Adiposis Dolorosa.—Grafe reports a case in which the onset of the disease at the early age of 14 was unusual, as there is only one other case of record (White) in which the disease appeared at an earlier age than 30. The symptoms were also unusual. Ordinarily the deposits of fat are tender and spontaneous pains (commonly of a neuralgic or rheumatic order) are slight, and only appear occasionally; in Grafe's case there was scarcely any pain on pressure, and spontaneous burning sensations and an inner feeling of great tension characterized the subjective aspect of the case. In other reported cases the periodicity of the pains and the fact of their appearing just before the beginning of new bunches have been ascribed to new deposits of fat infiltration, but Grafe thinks that the cause of the intermittent pains in his patient was accumulation of water in the fatty tissue, and perhaps in the musculature also. This alone would explain the intermittent swelling up of the deposits of fat and their subsidence at certain times. Bernoulli has published a case suggesting this in some respects. He called it a case of "false obesity from retention of fluid."

Formula for Determining the Relative Size of the Heart.—Geigel thinks that the main question from the clinical standpoint is not "How many cubic centimeters does the heart measure?" but "How many cubic centimeters of heart muscle are there to the kilogram of body weight?" As a rough formula for determining this ratio, he measures the size of the heart orthodiagram shadow (S) in square centimeters, multiplies this figure by 3/2, divides the product by the weight (naked) in kilograms (W). The formula is thus $\frac{S\frac{3}{2}}{W}$. He has been using this formula for five years and has found it reasonably accurate and of great clinical value. He calls it the reduced heart quotient.

Effect of Ultraviolet Rays on the Blood.—Traugott states, as the result of his investigation, that ultraviolet rays do not affect the number of red blood corpuscles in man. Under normal conditions the same number of leukocytes are found in the capillary blood and in the venous blood stream. A uniform increase in the leukocytes takes place usually following raying with ultraviolet rays provided the sitting is continued long enough (from ten to fifteen minutes); if the exposure is of shorter duration, there will be a difference between the number of leukocytes in the capillary and in the venous blood. The increase caused by the raying affects leukocytes and lymphocytes alike. Another effect on the blood from the influence of the ultraviolet rays is that it coagulates sooner. The number of blood platelets is likewise increased.

Meat of Tuberculous Cattle.—Müller opposes the idea that the basis of judging tuberculous food-producing animals should rest on whether there is a blood infection or a lymph gland infection. He thinks the criterion should be the degree of pathologic changes. In the presence of a high degree of emaciation, the carcass should be condemned as totally unfit for human consumption; otherwise, if only certain organs are affected, it may be used subject to certain restrictions.

Wiener klinische Wochenschrift, Vienna

April 8, 1920, **33**, No. 15

Diagnostic Significance of Examination of Vestibule of Internal Ear. S. Gatscher.—p. 305.
*Early Treatment of Corrosive Esophagitis. H. Salzer.—p. 307.
Friedmann Treatment for Tuberculosis. M. Weiss.—p. 307.
Pelvic Abscess After Gunshot Wounds. W. Sacken.—p. 310.
Latent Syphilis and Changes in the Spinal Fluid. J. Kyrle.—p. 313.
Conc'n.

Early Treatment of Corrosive Esophagitis.—Salzer waits only from two to six days, that is, until the first severe symptoms from swallowing the caustic have subsided, before he begins preventive treatment by introducing a weighted bougie to ward off the development of a stricture. His twelve patients thus treated all recovered and showed no trace of stenosis when dismissed from the hospital. According to Hacker, a well known authority on the subject, more than 50 per cent. of the patients who survive the swallowing of caustic alkalis, have a severe stricture of the esophagus, and the rest, with few exceptions, mild strictures, and 33 per cent. of those who have strictures succumb from the effects. Salzer finds that by the old waiting policy, patients suffer great pain and often become greatly emaciated, whereas if early intervention is practiced it is not difficult to keep up nutrition, and the pain suffered is very slight.

Zentralblatt für Chirurgie, Leipzig

April 3, 1920, **47**, No. 14

Ten Years of Arthroplasty. E. Payr.—p. 313.
*Habitual Luxation of the Shoulder. F. Loeffler.—p. 324.
*End-Results in Primary Joint Injuries. P. Erlacher.—p. 327.
Two Crossed Safety Pins as Improvised Wound Clip. Hofmann.—p. 331.

Correction of Habitual Dislocation of the Shoulder.—Loeffler prevents the luxation by fastening the humerus to the acromion without opening the joint. Through a vertical incision on the outer aspect of the arm, from two fingerbreadths above the acromion to the middle of the deltoid muscle, he separates the fibers of the deltoid and holds them apart with retractors. The arm is then rotated to bring the greater tuberosity into prominence, and a tunnel is made in this with an electric drill and a corresponding single hole is drilled in the acromion above. The holes are enlarged and a strip of fascia, 2 by 10 cm., taken from the thigh, is passed through the tunnel in the tuberosity and one end through the acromion, the ends being brought together over the acromion and sutured, end to end. The arm in the case described can be lifted to 85 degrees and rotated, and further functional improvement may be anticipated.

Zentralblatt für Gynäkologie, Leipzig

April 3, 1920, **44**, No. 14

*Puerperal Inversion of the Uterus. F. Engelmann.—p. 337.
Intraperitoneal, Cervical Cesarean Section. Lichtenstein.—p. 343.
*Ascaris Lumbricoides in Fallopian Tube. P. Nacken.—p. 346.

Puerperal Inversion of the Uterus.—Engelmann states that inversion of the uterus seems to be getting more common than published statistics would indicate. On the basis of observations of three cases he holds the view that the Credé method, which seems to be universally used in cases of hemorrhage from atony of the uterus, may easily lead to inversion of the uterus. He therefore suggests that the maneuver be done with both hands and outstretched fingers, which he finds minimizes the danger. Unless there is pronounced shock, he recommends immediate reduction of the inverted uterus under ether narcosis.

Ascaris in Fallopian Tube.—Nacken reports a case in which a dead ascaris, 25 cm. long, was found in the suppurating fallopian tube.

Zentralblatt für innere Medizin, Leipzig

April 3, 1920, **41**, No. 14

Gurgling Sound with Suppuration in the Thoracic Cavity. W. Stepp and Bennighof.—p. 250.

April 10, 1920, **41**, No. 15

*Sweating Procedures and Secretion of Urine. H. Brütt.—p. 266.

Effect of Sweating Procedures on the Quantity of Urine and on Its Specific Gravity.—Brütt has been experimenting with the view to so modifying the Volhard test for the concentration activity of the kidney that in place of the dry-food diet that the test requires a sweating procedure may be substituted. He found that all healthy subjects did not react alike to the various sweating procedures. In some a maximal concentration of the urine was produced; in others a marked polyuria with very low specific gravity occurred, while in others, again, no appreciable effect was noted. While it was evident that a sweating procedure could not in all cases be substituted for the Volhard test, the experiments showed that in applying sweating procedures to kidney patients if a specific gravity of 1.030 for the urine could be shown, we are justified in assuming that the concentration activity is satisfactory. But if there is no increase of the specific gravity, or if there is a decrease, either with or without an increase in the quantity of the urine, no definite conclusions can be drawn in regard to the functional capacity of the kidney. Only the positive result is decisive—and it is only in a small proportion of these cases that such a result is secured.

Acta Medica Scandinavica, Stockholm

May 6, 1920, **53**, No. 3

*Xanthochromia in Cerebrospinal Fluid. A. Wallgren.—p. 303.
*Etiology and Pathogenesis of Sciatica. F. Lindstedt.—p. 318.

Xanthochromia in Spinal Fluid.—Wallgren regards the hemorrhagic tendency of epidemic meningitis as one explanation of the xanthochromia observed in the cerebrospinal fluid. Or the xanthochromia may come from stagnation of the spinal fluid from obstruction of communication with the cranial subarachnoid space. In 103 cases of epidemic meningitis at the Upsala hospital in the last five years the mortality after the first twenty-four hours was 19.6 per cent., but it was only 14.8 per cent. among the 74 without xanthochromia while it was 39 per cent. among those with xanthochromia. The total mortality in these groups was respectively 28.3 per cent. 25, and 42.1 per cent., testifying to the gravity of the cases in which xanthochromia is observed. It forms part of what he calls the syndrome of Froin, that is, the spinal fluid is frankly yellow, with abundance of albumin, coagulates *en masse*, and contains numerous mononuclears. It not only throws light on the prognosis, but warns of the necessity for intraventricular injection of the antiserum if the condition is not improving under spinal injections. More attention should be paid to serotherapy by the vein in these cases, as epidemic meningitis is a general septicemic condition, not confined to the meninges. The details of six cases are described to sustain these conclusions and two pages of bibliography are appended. The article is in French.

Sciatica.—Lindstedt declares that it is impossible to draw the line between neuritic, myitic and neuralgic symptoms in sciatica, and states that in practically all of his 100 cases he found abnormal conditions of traumatic, inflammatory, neoplastic or varicose nature in the bones, joints, or soft parts of the legs, back or pelvis, usually near the course of the sciatic nerve, or else deformity of some kind or static anomalies. The nature, the localization, the chronology and the frequency of changes of these kinds in his cases of sciatica testified to a causal connection, the irritation from these abnormal conditions entailing in time a functional overexertion of that part of the central sensory nervous system involved, until it gets the "neuralgia habit" from the constantly recurring irritations from the periphery. This conception of sciatica opens new horizons for treatment of both sciatica and lumbago, and explains the benefit from empiric measures and also the neurotic or psychic factor prominent in certain cases. The article is in German.

Finska Läkaresällskapets Handlingar, Helsingfors

March-April, 1920, **62**, No. 3-4

*Hematogenous Nephritis. B. Runeberg.—p. 165.
Hairs in Supernumerary Nipples. Y. Kajava.—p. 210.
*Postdiphtheric Stenosis. H. Bardy.—p. 223.
Heterochromia of the Iris. J. G. Lindberg.—p. 231.
Bothriocephalus Latus and Digestive Symptoms. G. Becker.—p. 240.

Aseptic Renal Pyuria.—Runeberg was surprised to find that in only 33 per cent. of his 56 cases of aseptic renal pyuria was tuberculosis responsible. In 12.5 per cent. a calculus was a factor. An individual predisposition rather than any special causal agent is involved in this hematogenous pyelitis persisting interminably. The staphylococcus was most often responsible in his cases. The pyelitis is abacterial only because it does not reach us in the florid stage; sections of the kidney usually reveal the bacteria. His histologic and clinical experience has demonstrated, he says, that the blood borne infection induces first a glomerular nephritis, sometimes too mild to induce appreciable symptoms; then elimination of bacterial and waste products entails foci in the kidney tissue and an elimination pyelitis. Interstitial nephritis develops gradually from this, with subcapsular foci and possibly complicating thrombotic and embolic processes. It seems to conflict with this theory, he admits, that 17 per cent. of the 23 men in the 30 operative cases had prostatitis, but we know that urinary disease is a disease of an apparatus not of a single organ. Examining the pus in the urine of 10 tuberculous and 10 of nontuberculous abacterial pyuria and a large number of other pathologic conditions in the urinary passages, Runeberg found striking and characteristic changes in the leukocytes only in the tuberculous cases. The leukocytes showed uneven, polyhedral, gnawed edges, and they took the stain badly, while with other infections they were usually round and stained normally. With tuberculosis, the nuclei may drop out and vacuoles appear. Acute onset and alternation of symptoms and free intervals testify further against tuberculosis, but if the unilateral pyuria is sapping the patient's vitality, nephrectomy is indicated as the kidney will usually be found malformed or otherwise congenitally inferior. This was manifest in 3 of his 10 nephrectomy cases. His experience has confirmed the prompt subsidence of the symptoms of cystitis after nephrectomy for blood borne pyelitis, proving anew the integrity of the bladder. In 2 cases an abacterial pyelitis flared up and bacteria appeared in the urine under the provocative influence of operative measures elsewhere. This secondary flaring up of this elimination pyelitis might prove misleading in some cases.

Treatment of Postdiphtheric Stenosis.—Bardy reviews his experience with stenosis of larynx or trachea rendering it impossible to discard the tube. From five to fifteen months was required for the progressive dilatation, and any method will succeed, he says, if perseveringly applied. The tracheotomy tube has to be worn during the whole period of dilating as acute edema is liable to develop otherwise. He found Schmiegelow's translaryngeal permanent drain method difficult to apply to small children and liable to set up inflammation. The diphtheria in itself, without intubation, may induce necrotic processes responsible for stenosis, as in one of his cases, but as a rule the stenosis develops at the end of a tube. The mucosa in diphtheria seems to be exceptionally sensitive to mechanical irritation.

Hospitalstidende, Copenhagen

March 24, 1920, **63**, No. 12

*Nail Extension for Old Fractures. E. Nielsen.—p. 177.
Action of Light on Vitiligo. C. With.—p. 182.

Nail Extension for Old Fractures.—Nielsen cut away the callus and reduced the overlapping stumps in two cases of fracture of the femur which had healed three or four years before with a shortening of 6.5 to 7 cm. He then applied weight extension from nails driven into the bone, and the deformity was corrected, the shortening being reduced to 1 and 1.5 cm. Except for a little pressure necrosis, there were no mishaps; the nails were removed the twenty-first day. The only inconvenience from the method was from the counter pressure in the perineum and axillae. The counter pressure was aided by raising the foot of the bed.